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GUARANTEE.

What Do You Think it Means? What Do the Men You Deal With Think it Means? What it Should and Must Mean.

Every man in the plumbing, heating and lighting business is interested in the word and thing—Guarantee. We could not have chosen a subject of more vital importance. It is a dynamic word, capable of making or destroying business according to its use and application. There is no middle ground from which guarantee can be viewed with indifference. Every man is either for or against it; he either esteems it or fears it. In dealing with words, it is safe to act as we do in dealing with people. We must be introduced to them. We would like to know their pedigree, their standing, their associations and their capacities.

"Guarantee" and "Warrant" are twins. Their family extends back in Etymology for hundreds of years. As far as we can ascertain, they both come from the same Teutonic word "Wahren," which means to defend or make safe or binding.

The most popular definition of guarantee is to engage, assure or secure as a thing may be depended on.

We will therefore in discussing the guarantee question, take the meaning of the word in its protective sense. If you are considering the guarantee, you are looking for something that may be depended on. You are endeavoring to secure the goods you install under conditions that make that installation safe or binding.

Actually there is nothing in the world that is sold or bought that is without a guarantee either expressed or implied, whether it be recognized or not. Possibly the cheapest articles of commerce are pins and beads. They are so cheap that one would be tempted to believe that a guarantee in the purchase of these is non-existent. Yet if you buy a package of pins and find that they had no points, and the majority of them had no heads, you would be justified in thinking that you had been fourflushed by the manufacturer or the jobber in

being handed pins that were unable to properly perform their function. If you purchase beads in quantity and find that 75 per cent of them had no holes, you would be again disappointed. In fact, in all things material, and for that matter universal, we are obliged to consider that they must possess not only form, but function, and the fact of their being placed on the market at all, should in itself be a guarantee that they have both.

What is true about pins and beads, is also true of plumbing and heating supplies. They have a form and are supposed to have a certain function. Both these must meet with the demands of the market and the consumer, or else fail in the guarantee, which is implied by their placing on the market. The question that arises is how far the guarantee of the manufacturer should extend, and this has been a sore point for years between the plumbers and steam-fitters and the manufacturers.

We receive numerous letters from time to time, giving us specific cases of real or supposed grievances due to the non-fulfillment of guarantees, expressed or implied, and some of these we will consider at the present time. For obvious reasons we do not quote names and places. We are studying conditions and not personalities with the view of finding a solution to the problems involved and establishing firmly a basis for future guarantee conditions which will prevent future dissatisfaction and give fresh stability to industrial conditions.

The first quotation is an interesting one:

"Here is the position that the members of the supply associations take and it is an agreement that all of them are expected to rigidly adhere to. If they ship me a defective piece of goods, the only restitution they will make will be to furnish another piece of goods to replace, but will not even pay the freight and drayage, the cost of the labor for the second installation nor any other expense occasioned by reason of their defective goods. This means that a manufacturer can sell goods which he knows are not up to standard and run the risk of getting them off his hands by simply sending another piece of goods when he gets caught at it. It also means that a jobber can handle the poorest class of goods, recommend them to the plumber as being first-class when he knows they are not so, get first-class prices and if the plumber does not kick, they go through and if he does kick, he only gets a new piece of goods and installs them at his expense. It is nothing but a skin game from start to finish. Why should the plumber be asked to guarantee a piece of goods that the men who makes it will not guarantee? The plumber buys them for first-class and pays a first-class price. Why should he be compelled to bear the expense of replacing when if the article had been all right there would have been no such expense. Suppose when I take a contract, I should say to my customer, 'Mr. Smith, I will furnish all these goods first-class, but if any of them should prove defective, I will furnish a new piece to replace, but you will have to pay me for the extra labor and the freight and drayage. If a fitting has a sand hole in it, I will furnish a new one, but you will have to pay me for putting a good one in. If a valve is not good, I will furnish a new one but you must bear all other expenses to put it in. If the enamel comes off of the nice roll-rim sink, I will have the factory send me a new one, but you must pay the freight, drayage and boxing on it, the drayage to your house, the drayage on the old one from the house to my shop, the cost of reboxing it and the drayage on it to the depot and the time for my men to put the new one in.' How many jobs do you think I would get if I should make the above a part of my proposition when making a bid? Yet that is just exactly what the manufacturers and jobbers tell the plumbers and the steam-fitters when they sell them the goods. And yet they get up and make a howl that can be heard to high heaven (no, that is wrong for their voices could not travel in that direction), because the plumber or steam-fitter wants to switch the goods when some particular line is specified."

A careful study of this brings to light three definite features. First, there are manufacturers who manufacture goods below standard, having the form of goods desired, but not able to perform their function. Second, there are jobbers who are willing to handle these goods. Third, there are plumbers and steam-fitters who are willing to buy them.

It is under the third head that we must look for the solution to this difficulty and not under the first two. When plumbers and steam-fitters get wise enough to demand that the goods which they buy shall bear some distinctive stamp showing their source of manufacture, there will cease to be serious complaints about defective goods. We, as a nation, have been educated during the past ten or fifteen years at an expenditure of hundreds of millions of dollars in advertising to consider the goods with the brand as possessing a guaranteed quality not obtainable in goods without a brand. There can be no argument about this matter whatever. The high-grade manufacturer in any industry takes a special pride in manufacturing his goods and welcomes every possible opportunity of advertising the factory in which they are made. It is a poor job to which a man will not gladly attach his nameplate, if trade-conditions of sale warrant him doing so. The undertaker and the doctor are the only people who are safe in putting their work underground. As long as there are plumbers and steam-fitters, who, under pressure of real or imaginary commercial conditions, demand low-priced, unparented and unguaranteed goods so long will manufacturers and jobbers be found to manufacture and supply them.

The second quotation, you will notice, deals indirectly with the sub-contracting evil:

"Let me tell you that the manufacturer who makes square goods don't need to run after the architect to get his goods specified because that manufacturer is bound to have his goods used by the plumber, whether specified or not. They all get to **know him.** But the ones who do not make the right kind of square goods and who do not give the plumber or steam-fitter the right kind of protection, is not able to sell to these parties and must resort to soliciting the architect to get their goods speci-

fied, give the architect a commission and make the plumber pay this commission and then make a howl because the plumber switches the goods because he knows that the goods will give him trouble. Can you blame the plumber? There is always a good reason why the plumber wants to switch the goods. Talk about buying an architect! Recently I had a large job where the goods had to come from a certain firm. This firm makes a few lines of goods and is a jobber on the other lines. They were jobbers of most of the fixtures instead of being manufacturers of them. But I was compelled to buy all of them from this firm or the architect would make me trouble on the job because he would lose his commission if I bought them from the party who made them or from some other jobber. It happened that there were five pieces of one kind in the job for which the firm agreed to hold me up for $117.00 each. They were slow about shipments and did not live up to their agreement in getting these goods to me and at last I had everything finished except the installation of one of these fixtures and the building must be turned over. People higher in authority than the architect told me to get this last fixture from any one I could. As it happened, this article was made by the eastern potteries. I jumped on the train for Chicago and found one in the stock of another jobber and bought it for just $22.00 less. The $117.00 price was to be from the factory while the $95.00 price was from the jobbers stock and had I bought it from him f.o.b. factory, I could have bought it at even a less price. I do not know what proportion of this $22.00 the architect got, but I know I was held up for $117.00 so the architect could have a commission."

It is up to the plumbers and steam-fitters of the country to put an end to this evil by refusing to bid on jobs as sub-contractors. The plumbers of San Francisco and the steam-fitters of Chicago have made the first important move in this direction, and we fully expect that it will not be long before other towns and cities follow suit in this regard.

The other quotations illustrate in a graphic way the different instances of grievances which reach our editorial desk.

"I once installed a hot-water heating job in a house already occupied, and when I turned on the water, I found 17 defective cast-iron fittings which had sand holes. The fittings were worth about $1.25 and it cost me about $20.00 to replace them in the job. Wouldn't that have been a good thing for me to have to stand all that expense? Well, you can bet your life that I charged it to the manufacturer and he stood for it because I deducted it from what I was owing them and did not want to try to collect it legally. I do not buy enameled goods from a jobber but in one instance I bought a large and expensive sink from a jobber just on account of giving the salesman an order. The sink was sent me from one of the factories not recognized as making the best goods, but I paid the regular price for it. The sink turned out badly, and I had them send me another one and it turned out just as badly, and then I got one from a first-class factory and it has been in ever since. The jobber did not want to allow my expense bill and his excuse was that they were in an agreement to only send a piece of goods to replace the defective one.

Recently I had a lot of radiators which leaked very badly and yet the factory swore by all that was holy that they had tested them. How could this be when some of them had sand holes in them that you could stick a nail through? Yet all the radiator manufacturers are supposed to have the same price and agreement about replacing defective goods. Well when I get settled up with them I won't buy any more of that pattern. I installed a boiler that had the holes for the bolts to hold the front doors drilled through to the inside of the boiler. When I turned on the water, I had a fountain. When I reported it to the factory, they could not understand it for they said that all their boilers were set up and tested before leaving the factory. Do you think they did? And they had the nerve to only want to send me a new front and not to pay for my expense on it. But I took it out of the bill and have never used one of these boilers since. You see, their method was too good for your uncle Dudley. It costs from twelve to twenty per cent to run business and yet some of the manufacturers wonder why it is that a plumber objects to selling their goods which they quote to the plumber at 20 per cent discount, boxing, freight and cartage added. If the customer happens to see the list price, and he is bound to see it when you show him the catalog, then he thinks you are robbing him for asking above the list while if it is sold at list it is handled at a loss. These manufacturers depend on the architent whom they buy to get their goods specified."

We do not believe that there is any reputable manufacturer or jobber who intends to stay in the business who would not have satisfactorily settled grievances such as these. It is always recognized as true that "a satisfied customer is the best advertisement." We know of numbers of cases where defective goods have been replaced in a most liberal fashion as soon as the complaint was recognized as justified. Unfortunately for human nature, the kicks are published in capital letters and words of praise scarcely ever find their way to the linotype machine. It is difficult to suppose that the plumber of good standing in his community and the manufacturer of high caliber cannot do business together without the possibility of adjustment in time of trouble.

The alteration of these conditions is in the hands of the plumbers and steamfitters and not in those of the manufacturers and jobbers. These last will meet any demand imposed on them by the purchaser. Most manufacturers are anxious to make the best wares possible and to sell them at prices within the range of the public pocket, but allowing a margin of reasonable profit.

Referring to the architect's case above cited, how impossible would this case be if the plumbers of that particular town had refused to act as subcontractors, and if the plumbers of other towns belonging to the associations had held the same opinion. The tide of opinion in these matters is slowly turning. This was shown clearly by some of the resolutions at the recent state conventions. We believe that at future conventions, more definite steps will be taken to cure the plumber and steam-fitter of the sub-contracting disease.

"Domestic Engineering" is a reflector of the mental attitude of those engaged in the professions it

represents. This editorial is not written on the spur of the moment, based upon the complaints of one angry and disgruntled man. Every week we send out printed forms to plumbers and steam-fitters in all parts of the United States requesting information and replies to certain printed questions on specific points. One of these requests topics for future editorials. It is in answer to this question that we obtain numerous inquiries for a writing on the guarantee. These quotations therefore are typical of similar statements made by others.

Now as to the possible means of adjusting the causes of difference. If these complaints represent any considerable proportion of the grievances of the trade, it should not be difficult at future conventions to secure the appointment of state committees of complaint, whose chairmen would compose a national board of complaint. This board would meet at stated times with a similar committee appointed by the manufacturers and serious cases would be considered jointly and means devised to prevent their recurrence.

These committees might consider, for instance, the advisability of establishing a standard of guarantee on certain goods, concerning which the greatest number of complaints is received.

They might take up the matter of devising an inexpensive apparatus by means of which the common defects might be detected before installation. This device could be owned jointly by the members of the local association and used to test fittings, etc., so as to prevent their installation before the defects became known.

The committees might arrange to have manufacturers stamp all wares of a certain grade with a distinctive mark, such as "Naco," these goods bearing with them the guarantee adopted for them. The plumber then who purchased unstamped goods of that class or type would know that the risks of defect belonged to him and that he was buying them under the old Latin warning—"Caveat emptor" or "Let the buyer beware."

Manufacturers and jobbers are not philanthropists any more than are plumbers and steam-fitters. If a plumber asks for a near-enamel bath-tub, built of concrete and covered with a glossy paint, there will be manufacturers to supply his need. If the present ones would not undertake to manufacture it, there would soon spring up competitive manufacturers who would do so. A stream can rise no higher than its source. As long as the rank and file of the plumbing and steam-fitting trades, from whom the best men spring, are content to class themselves as price-cutters, or to be considered as such; as long as they allow some contractor, jobber or manufacturer to do the selling of their products; as long as they are content to swim with the stream of commerce instead of against it; so long will unstable conditions be found in their relationships with the contractors, manufacturers and jobbers.

The game of life is too important a one to be decided by haphazard throws of the dice. If the associations are 10,000 strong, as is claimed, the demonstration of this strength can be made effective at any time they please, when individual complaints cease and intelligent and concerted action takes their place.

It is our belief that most manufacturers and purchasers possess sufficient innate honesty and breadth of intelligence to remedy jointly any disagreements that may arise from time to time. The solution of the problem is in the power of our readers. We have not attempted to cover all the phases of the situation owing to restrictions of space. We are merely pointing, by special request, to conditions, and the possibilities of their removal. Now if some of the "live-wires" of the business will write their ideas on this subject, we will be glad to consider the different phases and solutions presented. It is an important topic. You have your views on the matter. Write them now.

CONTRACTS AWARDED.

John G. Sutton Co., San Francisco, has secured the contract for the installation of a heating and ventilating system in the Peabody Primary school-building in that city.

P. S. Thomas & Co., Harrisonburg, Va., has been awarded the contract to install heating and plumbing systems in the dormitory of the State Normal School, the amount being $6,885.

The Peoria Plumbing Co., Peoria, Ill., has secured the contract to install the entire heating and plumbing, Kewanee water-supply system and sanitary sewer system in the Walter Kirk residence on Grand View drive. The contract amounts to $2,500.

Fitzpatrick & Hoepfner, Columbus, O., have been awarded the contract to install a complete heating and ventilating system in the main building at the Ohio State University. It is one of the largest contracts of its kind awarded in this section for a long time.

Joseph H. McPartland, Houlton, Me., is installing bathroom plumbing and hot-water heating in the new residence of A. L. Lambert; plumbing and hot-water heating in George White's new residence; and hot-water heating plants in the residences of Dr. F. W. Mann, C. E. F. Stetson and M. M. Clark. In addition he has several out-of-town contracts on hand.

Frank E. Garrity, Waterbury, Conn., has a large number of plumbing contracts in hand. He is just completing the plumbing in St. Margaret's church on Willow street and has contracts for plumbing and heating in a 3-family house on Plaza avenue for L. I. Watkins; plumbing and tinning on the house of J. E. Kefford on Pearl street and plumbing in the 2-family house of Mrs. Lucy Kennedy on South Leonard street, all in Waterbury.

The contract for the plumbing in the handsome new residence of P. W. Brooks on West Rocks road, South Norwalk, Conn., has been awarded to the Heating and Plumbing Co, Norwalk.

He Knew.

A certain jurist was an enthusiastic golfer. Once he had occasion to interrogate in a criminal suit a boy witness from Bala.

"Now, my lad," he said, "are you acquainted with the nature and significance of an oath?"

The boy, raising his eyebrows in surprise, answered:

"Of course I am, sir. Don't I caddy for you at the Country club?"—Success.

The Relation of the Plumbing Inspector to the Public

By Wm. G. Williamson, Inspector of Plumbing, Detroit, Mich., President A. S. I. P. and S. E.

It is only in the last few years that the public has become conversant with the duties of the inspector. Not many years back the plumbing of a house or building was put in regardless of whether it was sanitary or not. If a man wanted a closet in his house, the so-called plumber came and put it in. No inspection was made as to whether it was put in right or not. Not long after this the owner noticed bad odors and stoppage in the soil line. The plumber was called; result, more expense to owner for plumber's bills and also doctor's bills. Today the plumber's work is given a thorough inspection and unless done according to the rules and regulations relating to plumbing, it is not accepted and it must be corrected as designated by the inspector. He because of his office must have had practicable experience, be educated, and thoroughly competent to cope with all the conditions he may come in contact with and give an impartial decision in all cases. The duties of the inspector should be broad and expansive. He is a public servant and therefore must aim to serve them for the betterment of their condition along sanitary lines. Much abuse and discredit is heaped upon the inspector for the reason that he insists that the plumber do his work right, knowing that if he passes inferior work, the owner or occupants of the premises will suffer from it. Not only do many of the journeyman plumbers make trouble, but in many cases the master plumbers are at fault. After they have started a job they find they have bid too low to give the owner the class of material the plans and specifications call for, so they try to get the inspector to pass it and let them get out at least even on the job. Because the larger portion of the plumbing system of a building is closed to sight so much more does the inspector serve the public, and in serving the public he must keep abreast of the times. The public demands clean, healthful surroundings and pays taxes for them. It therefore behooves the various cities to have men as inspectors of plumbing who will do their work to the betterment of their fellow citizens. It behooves him to be at his best at all times and courteous to his fellow citizens, as his position sustains a peculiar relation to them and also to the city government as a whole very much different from that sustained by the private citizen. On him, to a great extent does the growth and popularity of the city depend. These cannot be brought about except the best possible means for sanitary conditions to be had are put into use. Many of the older cities are in a poor sanitary condition today because too much of the old style of plumbing is allowed to be installed instead of putting in the less extensive and up-to-date systems. And yet, with all the forceful argument the inspector has, it is surprising how hard a time he has in getting the owner of a house to realize the necessity of putting in up-to-date plumbing in his house to make it right and sanitary. It is the duty of the inspector to see that proper sanitary appliances are put into use to remove the causes of a large class of fatal diseases. Public sanitary improvement and also private is or should be his aim and his effort is to make the inside of buildings and their immediate surroundings as healthful as modern and up-to-date as sanitary ideas can make them. He it is who is willing at all times to cooperate with public and private individuals to bring this about. Public control in the interest of the public must extend to the sanitary condition of every houshold, not alone among the poorer class, but much more so among the rich, where there is a greater variety of fixtures and of necessity—plumbing work. The preservation of one's self comes first, but we disregard it constantly in the laying out of our life and health by living among the foul conditions prevailing among our neighbors, blindly relying on the skilful yet ill-advised work of our well-paid but untaught plumbers. Because we have life is no reason why there should be disease. It is due to an unnatural condition of living, as neglect, want or abuse. We all desire health and it is to be found by creating public realization of the neglect of conditions which are unsanitary. It is a fact that many of the contractors who are in the habit of rushing in work complain bitterly because of the rigid enforcement of the rules pertaining to their work. Now this is where the inspector shows his hand in protecting the public against poor installation of the sewers and plumbing. It is also an important duty of the inspector to see that the quality of the material is up to the standard. No matter how good the regulations are they will be of little good, unless carried out in a thorough and conscientious manner entirely void of the seductive efforts of contractors to secure their neglect of duty. It is my hope that these few lines may bring about a harmonious feeling between plumbing inspector and the master and journeyman plumbers and a feeling of brotherly helpfulness between inspector and public.

THE NEED OF CONSCIENTIOUS PLUMBING INSPECTORS AND SANITARY ENGINEERS.

The article which precedes these editorial paragraphs and the next eye-opening contribution will sufficiently emphasize the message of the above caption without any further comment. We surely need inspectors of plumbing and sanitary engineers of the highest caliber and we are naturally vitally interested in any movement or association capable of maintaining a standard of quality in those occupying such important positions.

The Society of Plumbing Inspectors and Sanitary Engineers is at present the sole claimant of the privilege of their representation. The society is as yet in its infancy and has done well to uphold its membership as it has done since its inception. The present rotten condition of association of political and municipal affairs is a menace to the stability of the organization. Good and capable plumbing inspectors, whether appointed as a result of their fitness for the post or being politically appointed have made good in spite of that drawback, are liable to removal at the autocratic nod of a wire-pulling trickster. A city should be run as a large business enterprise is run. It is a greater enterprise than any of the largest commercial enterprises in the country and yet it is managed for the most part on a plan that would bankrupt half the business-houses of the country at every election. Of all municipal offices, the board of health should have stability of condition impossible of attack or undermining by "pork-barrel" upheavals. Its heads and its employees should be selected and retained only according to their ability to act as guardians of the public welfare with efficiency and honesty, and the last is as great as the first.

The sanitary engineer is another genus homo. Unlike his associate, the plumbing inspector, he is self-appointed and self-declared. At present, we are obliged to take him at his self-declared valuation. There are already several very prominent sanitary engineers in the country and in fact most of those laying claim to the title S. E. are sincere in making the claim and possess marked ability in this direction. At present there is not enough money in the title to bring into the field many false claimants. It would be well however at the Milwaukee convention for the association to draft up definite standards by which plumbing inspectors and sanitary engineers may qualify as eligible to active membership in the society.

Flagrant Examples of Bad Plumbing

By Thos. J. Claffy, Assistant Chief Sanitary Inspector, Chicago

We very often hear severe criticisms of the plumbing craft, because a man cannot be his own plumber without finding himself in trouble. The average man of an economical turn of mind seems to have unlimited confidence

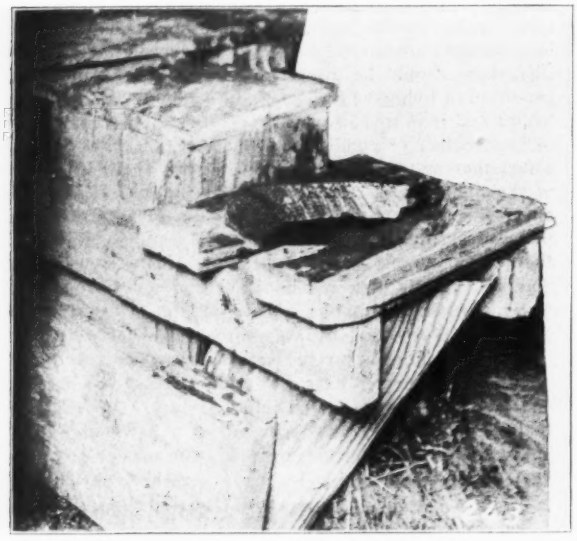


Fig. 1.—A Galvanised Trapless Closet.

in his individual ability as a plumber. His family or his tenants invariably suffer the consequences. The price paid for good plumbing work is never too high when measured by service, convenience, comfort and safety.

There is a prevailing contempt for vents, revents, traps,

Fig. 2.—An Undertaker's Helper.

etc., among those who have only a very limited knowledge of sanitation, and a belief by no means uncommon among such people, that a Board of Health in trying to enforce compliance with sanitary laws is actuated solely by mercenary and monetary motives.

The experience of any sanitary engineer, health officer, inspector or plumber, convinces him that sanitary laws are necessary, that preventive medicine is invaluable, and both are useless without constant and efficient supervision and enforcement. Many of man's ailments are without doubt due to the breathing of bad air. Bad air is very often saturated with gas of one kind or another, and within buildings this is due in nearly all cases to defects in the plumbing system.

The kind of plumbing installed by the owner or the "man in the street" is very well illustrated in the following illustrations, which are made from photographs of actual conditions found in the daily rounds of the sanitary or plumbing inspector.

Fig. 1 represents a water-closet found in use in the basement of a building where employees were obliged to grope

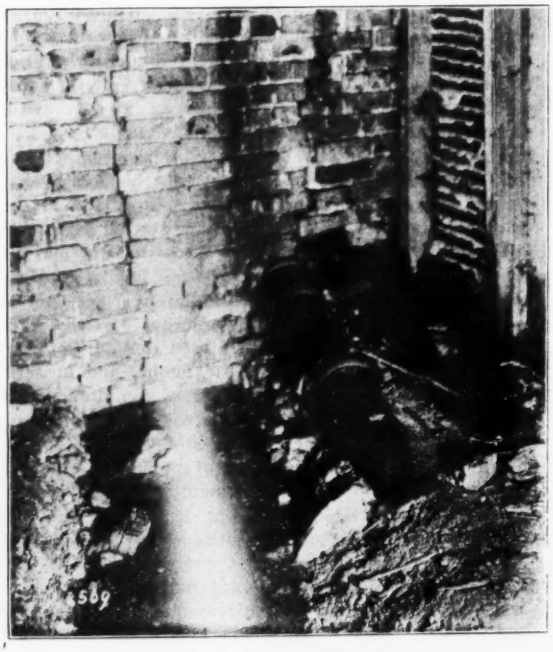


Fig. 3.—A Bacterial Paradise.

their way through a dark passage to reach this beautiful example of home-made plumbing. Two rough boards nailed to brackets over a hopper made of corrugated sheet-iron leading to an opening in the house-drain—no traps, no water-supply, no daylight to throw its glare upon the "inhabitants."

Fig. 2.—What a beautiful example of the home-made arts and crafts type of fixture this is! No necessity to explain the working of this example of simplified plumbing. Its good and bad points stand out boldly. The only thing lacking here is the picture of the undertaker.

In Fig. 3 we have an example of the work of the "handy man." Tile-drains are so "handy" that all you need do when there is a stoppage is to "punch a hole" and rod it. The hole usually remains, and so does the sewage. The gases then get in their deadly work, and soon comes the physician, the undertaker, then the Board of Health and the plumber. It would have been better had the plumber and the Board of Health come first.

Flagrant Examples of Bad Plumbing

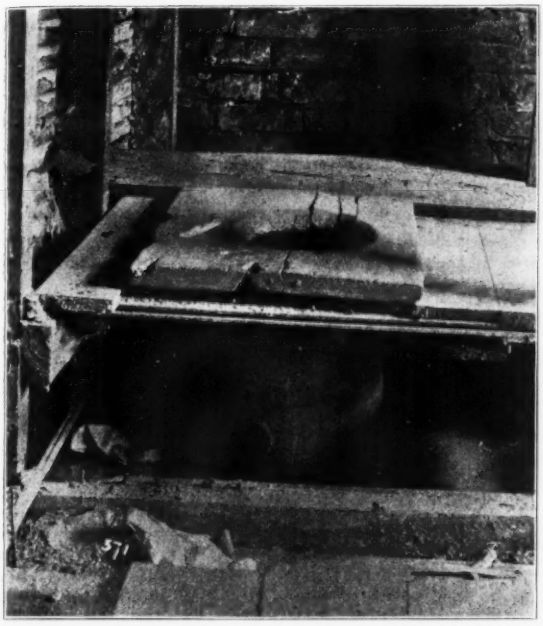


Fig. 4.—Closet-Combination of Butter-Tub and Split Seat.

Fig. 5.—A Malodorous Home-Made Water-Closet.

Fig. 6.—We offer $5.00 for any photograph which surpasses this as an object-lesson in public or private disregard of the decencies of life.

Figs. 4 and 5 are both examples of home-made water-closets placed above a convenient hole in the house-drain. It would be a very bad case indeed that could be worse than either of those.

Fig. 7.—A Study in Unwiped Joints.

Fig. 6 is a story complete. You can almost hear the wails of the sick, hungry children, and the querulous voice of the heart-broken mother trying to soothe them. It is indeed a money-grabbing Health Board that would disturb the equanimity of a landlord in such a case as

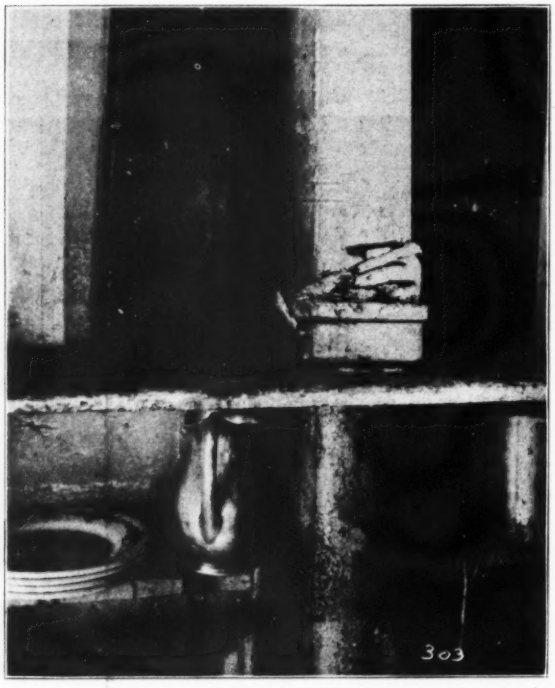


Fig. 8.—All Change at Germ Junction!

this. Criminal prosecution is what should be meted out to the guilty owner.

In Fig. 7 the flush-pipe for this closet was also the waste pipe from the kitchen sink. Notice the trap in it and the joint made with yards of wire, rags, and no doubt some putty. The seat has a most uncomfortable look about it, and the walls and floor speak volumes for the condition of the house.

Fig. 8.—Here we have a good illustration of the setting effect on soil-pipe where steam and hot water are freely discharged into the plumbing system, and the supports of the pipes are inadequate. In this picture we can see not only the lead, but the oakum as well, showing conclusively that there is nothing there to prevent the escape of gases.

The above illustrations are but types of what is found nearly every day by the plumbing or sanitary inspectors of the Board of Health in any large city. Such conditions are not always confined to the homes of the poor—very often in the palatial homes of the wealthy. Hidden sources of pollution similar to Fig. 3 blight the lives of the little ones and cause untold miseries to those of mature age.

If there were no laws governing plumbing installation what would be the consequences?

MILWAUKEE AND WISCONSIN NEWS.

John W. La Velle, 172 Seventh St., Milwaukee, has recently secured several large plumbing and heating contracts, and he reports business better than it has been for years. He considers the outlook for the next year exceedingly bright.

Louis A. Riemer, 411 State St., Milwaukee, has secured the contract for the installation of an up-to-date heating system in the new Farmers' & Merchants' Bank building. He also has the contract for the new O'Neal residence, a thousand-dollar job. These and numerous smaller jobs will keep him and his large force busy for several months to come.

C. V. A. Voelz, formerly at 764 Third St., Milwaukee, is now located in his building at 726 Third St. in that city, which he purchased for $5,000. He plans to erect a new building for his plumbing establishment on that property, as soon as his many contracts are finished, and he will be able to give this matter proper attention.

Working in Chicago, the Milwaukee sewerage-commission is completing its report, which will soon be presented to the city-council. During the past week a crew of men, under City Engineer Poetsch, has been securing data for the commission. Four days were taken up in measuring the flow of sewage in the intercepting sewer in Fifteenth street, which is six feet in diameter. A weir was constructed near Grand avenue and one man was kept in the sewer constantly so that the flow could be accurately gaged. It is generally supposed that a large system of septic tanks will be erected to handle the sewage and that the storm-water will be carried off to the rivers as is now done.

The Menasha Plumbing & Heating Co. is preparing to move into new quarters in the Tuchscherer building, Main and Milwaukee streets.

Lloyd G. McCrum, president of the McCrum-Howell Co., while in Racine, Wis., recently, announced that the company would soon commence the erection of a 4-story addition to its Racine plant. The building will be equipped for the manufacture of electric motors for a stationary vacuum-cleaner, and the plant will have a capacity of 10,000 motors annually.

The Murphy Supply Co., Green Bay, Wis., has secured a contract for $920.19 worth of material to be used in the extension of the municipal heating system at Sturgeon Bay, Wis.

Andrew Thompson, Racine, Wis., has secured a contract for laying approximately 6,000 ft. of pipe-sewer at Janesville, Wis.

The J. J. Koepsell Hardware Co., Sheboygan, Wis., has secured the plumbing contract for the new church to be erected by St. Mark's Lutheran congregation in that city at a cost of $22,000. The heating contract has not been awarded.

Harry E. Briggs, commissioner of public works, will receive bids until November 12, for furnishing the city with 200 fire hydrants of the "Single Valve Mathews" or "Improved Stowell" pattern, in accordance with the specifications on file in the office of the department of public works. Also for three 30-inch gates valves with by-passes. Specifications for these are also on file in the department office.

A PRACTICAL MANUAL OF STEAM & HOT-WATER HEATING

BY EDWARD RICHMOND PIERCE

Last week, Mr. Pierce concluded the section with these words—"Now that they (the manufacturers) have thrown the burden of the garantee of the working of the boiler and the job on to the engineer or the steam-fitter, these latter have a just claim to be furnished with all the facts in relation to the ratings of boilers offered for sale." Thus refreshing your memory, you can now enjoy the reading of this new section.

SECTION XXVI.

Until this is done, the whole heating fraternity must continue to trust to luck in selecting a boiler, or else enter into a long and often fruitless correspondence with the producers of heating boilers. Because of the new conditions, established by the manufacturers themselves when they established the new ratings, the rules for the figuring for radiation which were applicable to the old ratings became useless for the man who desires to do reliable work. In fact the change practically forces every man in the business to get busy and learn the inside working, the why, and wherefore of boiler rating, in order to protect himself. It is quite certain that there are boilers on the market that the manufacturers thereof do not care to state in their catalogs the basis of their rating in full or even to give out enough information to be of much value to the average buyer. But when the manufacturers adopted the new ratings in 1903 they also forced upon themselves, and the trade, the present situation.

The new conditions compel the engineer and the steam-fitter, to study the heating question from a point of view new to many, if not to all of them. The boiler-rating no longer is large enough to cover the piping and all sorts of shortcomings. **The burden of selection and guarantee no longer rests upon the manufacturer; he has, therefore, no longer the moral right to withhold from the men whom he has forced to take the responsibility, all the essential facts in regard to the goods produced.**

If a boiler requires a stack-temperature of 700 deg. F. in order to deliver its rating, the man who is to put that boiler into a job and must garantee its performance, certainly is entitled to know of such an important condition. If, on the other hand, the boiler requires a low stack-temperature, but the fire-pot will only carry fuel for a 6-hour run at its rating, the man who has the burden of making the job hold steam for perhaps 10 hours, should know that the rating is for 6 hours, and also on what kind of stack-temperature the rating is based.

The manufacturers have transferred the most of the responsibility; they should now transfer **all the facts** in regard to the rating of the boilers they produce.

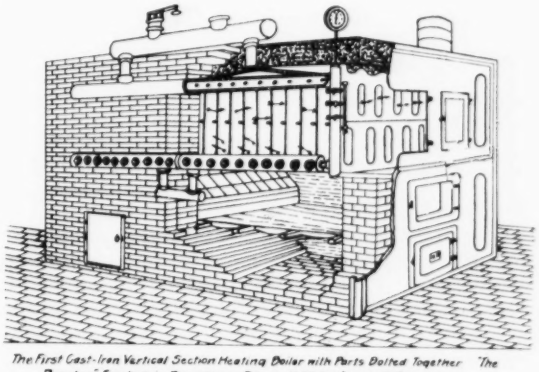
While considerable information in regard to boiler-ratings has already been developed in this discussion, it is evident that—

When two boilers with nearly 4 sq. ft. of grate surface and full 84 sq. ft. of claimed heating surface are rated for 500 ft. of steam-radiation—

And another boiler, made by a manufacturer as honest and reliable as the makers of the two mentioned, rates a boiler with only 3 sq. ft. of grate and about 40 claimed sq. ft. of heating surface to carry 500 sq. ft. of steam-radiation—

While another, whose standing and reputation is the equal of either of the others, gives a rating of 700 sq. ft. to a boiler with a grate of 3½ sq. ft. and a claimed heating surface of 45 sq. ft. that there must be other things to consider than the simple question of grate and heating surface that the boiler salesmen mostly talk about. But it will be well to examine into this matter of grate and heating surface in order to more fully explain the necessity for one producer to put 84 sq. ft. heating surface into a boiler rated for 500 sq. ft. while another can get the same results with about one half the amount.

There has been much less change in the construction of house-heating boilers from cast-iron, between those of the earliest types and the very latest, than many fitters think. In Fig. 17 is shown the "Brayton Cast-Iron Sectional



The First Cast-Iron Vertical Section Heating Boiler with Parts Bolted Together. "The Brayton" Erected in Providence, R. I., in 1867 by George B. Brayton.

Steam-Boiler" which was the first steam-heating boiler made of cast-iron with its sections bolted together after the modern fashion. This boiler was a good many years in getting recognition from the public. It was first designed as a power-boiler in 1849, and the shape of the cast-iron heating surface has never been materially changed to this day. With the necessary changes to adapt it to heating a building, such as the brick-setting, and the other minor changes such as would be made to-day in fitting a locomotive-boiler for house-heating purposes (for the original boiler was mounted on a locomotive) Mr. Brayton attempted to use the boiler for heating buildings, but he met with tremendous opposition. The wrought-iron boiler-manufacturers fought him at every step. The public were slow to believe that the cast-iron surfaces could be safe. Mr. Brayton however, had the courage born of knowledge and conviction, coupled with an indomitable desire to prove the correctness of his theory that cast-iron was the cheapest and safest material for

heating boilers. It was not until 1863 or 1864 that Mr. Brayton secured a contract to put one of his large cast-iron boilers into a building in a city of some size. At this time, he entered into a contract to place one of his boilers into a large building located in one of the principal streets of the City of Providence, R. I. The proposition created a tremendous discussion in the city. The wrought-iron boiler-men insisted that the boiler if put in operation would be a menace to life and property. Finally, the city authorities appointed "a special committee of scientists to investigate the character of the new construction in order that the safety of the citizens should be protected." When the committee met, Mr. Brayton suggested to them "that, in order to show them the entire safety of the boiler he proposed to heat the boiler red-hot from the absence of water and then to cool it down to its regular conditions of action, by pumping cold water," asserting that it could be done without danger. The committee rather objected to this, but proceeded to give the boiler a most thorough testing, and finally reported so strongly in favor of the boiler that the city authorities granted a permit for its use at any point within the city limits.

In 1865 the Massachusetts Mechanics' Association, at the American Institute Fair, awarded to this boiler the highest award it could bestow.

The public were not yet convinced that a cast-iron steam boiler was safe, for at this time it must be remembered that 60-lb. pressure was the usual, and 125 lb. to 200 lb., not unusual as the pressure carried on steam-boilers. The heating of buildings with steam had not yet become common.

In 1868 the Brayton boiler was tested by the then ablest associated body of scientists in the country—The Committee of Science and Arts of the Franklin Institute of Pennsylvania. The report of the committee on this Brayton boiler is in many ways a remarkable production. After Mr. Brayton had established the safety of his boiler he sold the patents he held on it and the patterns for making the castings, to the Exeter Machine Works, of Exeter, N. H., who changed its name to the "Exeter" boiler. Under this name the boiler has had an enviable sale and record in New England, New York, and Pennsylvania as a power-boiler and as a heating boiler, especially on blower-systems of heating. The "Exeter" was entered in the International Exhibition held at Philadelphia, Pa., in 1876, and again at the Chicago exposition, or World's Columbian Exposition in 1893. In each case this original type of cast iron boiler made a most creditable showing. The history of this typical boiler would not be complete without a short extract from the official report of a committee of the Franklin Institute of the State of Pennsylvania, to whom the Exeter Machine Works sent one of their boilers for examination as to its safety from explosions. Remember that the Exeter and the Brayton boiler are the same in construction. The committee say in part: "The Exeter Sectional Boiler comes very near to it, if it does not solve the difficult problem of uniting small compartments composing a boiler of considerable size, and at the same time provide for the free escape of steam without lifting the water. Many sectional boilers are so constructed in combining their parts as to cause the steam generated in the lower portion of the apparatus to force its way in zig-zag courses through a whole neighborhood of narrow passages or through a number of long, comparatively small, and nearly horizontal tubes, into which it is quite impossible for the water to promptly follow, as it should do in order to maintain perfect circulation, and take up all the transmitted heat before effecting its escape. In many cases these upper sections are alike subjected to the direct action of fire, and become, under a moderate supply of steam, highly heated, rendering them liable to fracture, without increase of pressure from sudden changes in the height of the water.

"The water in the 'Exeter' section exists in vertical masses, about 3¼ in. square and 28 in. high, a form favorable to the ready liberation of the steam to and from the surface of the water, and securing at the same time prompt circulation and supply of water to the heated surfaces of the boiler."

That portion of the above report which refers to the construction of water-ways in boilers, has not lost any of its force, or truth, in the years that have passed since 1870. Perhaps, at this time there are some, so-called, new boilers on the market that provide a splendid example of the type of construction that "causes steam to zigzag its way through passages that the water can not promptly follow.

(To be continued.)

NEW ENGLAND NEWS.

That the Boston and Massachusetts labor market is overstocked far beyond the demand, with the exception of plumbers and gasfitters, is the statement contained in the report of the Massachusetts state free-employment bureau for the month of October, which has just been issued. The bureau has more calls for plumbers and steam-fitters than can be supplied.

Mayor John F. Fitzgerald, Boston, has approved contracts for heating and plumbing the domestic administration-building at the new consumptives' hospital as follows: Heating, J. J. Hurley & Co., $5,046; plumbing, Pierce & Cox, $4,632. The bids on the work were as follows: Plumbing: Pierce & Cox, $4,632; Wells and Newton, $4,951; John O'Connell, Inc., $5,150; Robert F. Brown, $5,519. Heating: J. J. Hurley & Co., $5,046; Pierce & Cox, $5,233; James P. Dwyer, $5,300; Albert B. Franklin, $5,391; Brian & Brown, $6,012.

G. A. Orcutt, Conway, N. H., has the contract for installing a steam-heating plant in the residence of H. J. Pascoe at West Ossipee, N. H.

Alex H. Sjorlund has opened a plumbing establishment in the Monson building at Manchester, Mass., and has already several good contracts in hand.

Arthur F. Sexton, Windsor Locks, Conn., has opened a branch plumbing establishment on Water street in the Warehouse-Point section of Thompsonville, Conn., where he will do plumbing and tin-work of all kinds.

Ducy & Keir, plumbers, Thorndike, Mass., have taken on a number of new contracts recently. They are to install a steam-heating plant in the house of John Gray at Thorndike and a similar plant in the house of C. J. Coyer at Three Rivers. They also have the contract to place a steam-heating plant in the new block being erected by the Polish society at West Warren, Mass.

The contract for steam-heating in the residence of E. C. Brooks on Union street, Milford, N. H., has been awarded to George Moore.

Fisk & Flynn, plumbers, Middletown, Conn., have just closed the contract for the plumbing and heating of 10 houses to be built by the Shore Line Trolley Co., Saybrook, Conn.

Henry I. Rogers who has been in the plumbing business at Mars Hill, Me., for some months past has closed out his business and is now associated with P. W. Deane at Fort Fairfield, Me.

The Exeter (N. H.) Heating & Plumbing Co. is remodelling the store formerly occupied by F. F. Batchelder as a harness shop, and is soon to move to the new location. There they will have much better facilities for caring for the wants of customers.

Lester P. Carter, whose plumbing establishment at Bar Harbor, Me., was visited by fire a fortnight ago, has purchased an interest in a business-block on Cottage street where his plumbing establishment will be located in the future. While waiting to secure possession he is occupying a store on Main street which was formerly occupied by the National bank.

THE JOURNEYMAN AND HIS HELPER

JOIN HANDS FOR BETTER WORK

THE TOOL-OWNERSHIP QUESTION.

Editor "Domestic Engineering":—B. T. U. having come to the fore with some interesting dope on the tool-ownership question, would it not be fitting and proper at this time to hear from the other side, and having had about 12 years' experience as a boss or as my former boss' man, "Friday," I feel that my opinions may be worthy of publication and consideration.

Taking up the views of B. T. U. in the order given, I contend:—

First:—That I run a first-class shop, that I employ first-class mechanics, and that I **do** want my men to own their own tools.

Second:—That I **do** now employ a number of first-class mechanics who **do** own their own tools, have owned them for some time, and would not think of going back to the old way of having the boss provide the tools (I have just verified this by questioning the men themselves).

Imagine if you can and will, a carpenter reporting for work without his saws, hammers and chisels, a millwright without his ship augers, gages, chisels, saws, etc., a mason without his trowel, level or sledge, a tinner without his snips and soldering coppers; an electrician without his feeler-bit, brace, pliers, nippers, etc., and getting right down to cases, what would you think of a journeyman plumber without his wiping outfit, his calking tools, and the rest of his hand-tools? Why, it is as natural for these mechanics to provide these tools as it is for them to provide their own overalls, and overalls are about the only thing we have not as yet been asked to provide for the fitters. I therefore contend that the steam-fitter should provide the following kit and that the plumber should make some additions to his outfit as well.

To begin with, the boss should have a suitable place wherein the men can keep their tools (I have a tool room 12 x 22 ft.) and each mechanic should have a good substantial tool-box with a hinged cover and a lock, and a tool-bag of customary size and construction.

The journeyman plumber should have in his kit a complete set of calking, soldering and wiping-tools; a small screw-driver and a large one; a brace with expansion bits and small drills; a few cold and wood-chisels; a carpenter's floor chisel or bar; a 10-in. Trimo or Stillson, two 14's and a 10-in. monkey wrench; 6-in. gas pliers; 10-in. pliers; basin-wrench; a level; pocket-rule and tape-line; hack-saw; hammer; a few files; wrench for nickel-plated pipe; feeler; oiler; vise and lag-bolts; pipe-cutter and dies ⅛ to 1-in.; wood, key-hole and compass-saws.

The journeyman steamfitter should have in his kit a small screw-driver and a large one; radiator spud-wrench; a brace with expansion-bits and small drills; a few cold and wood chisels; a carpenter's floor-chisel or bar; a pair of snips; pocket-rule and tape-line; hack-saw; wood-saw, key-hole and compass-saws; a light and heavy hammer; a few files; a level; 12-in. monkey wrench; a 10-in. Trimo or Stillson, two 14's and two 18's; 10-in. plier; ⅛-in. tap; oiler; vise and lag bolts; pipe cutter and dies, ⅛ to 1-in.

The boss should provide sewer rods and plumber's friends, reseating tools, radiator arburs, testing pumps, furnaces, 24-in. pipe and monkey-wrenches, chain-tongs, big vises, sledge-hammers, taps, reamers and drills, and stocks, dies and pipe cutters, cutting from 1-in. up.

Of these tools, each plumber should be intrusted with a first-class furnace with pot and shield and he should be held responsible for its safe-keeping and its up-keeping. The fitter and also the plumber should be provided with a complete set of adjustable easy-cutting stocks and dies—Beaver or similar—cutting from 1-in. to 2-in., a good cutter to accompany same, a Mueller ratchet, reamer, vise, oiler, dope can, and a bunch of waste, all in a good substantial box with hinged cover and lock, together with a 24-in. pipe-wrench. This outfit should bear the plumber's or the fitter's name and should be for his use only while employed in the shop and turned over to the boss intact, should he be laid off, discharged, or quit.

This would insure of a man having tools with which he would be familiar; he would have no one but himself to blame for their misuse, and he would be able to do better work for the boss with less exertion for himself.

In using shop tools, which are used promiscuously by everybody from cub to foreman, there is no incentive for any one in particular to keep them in shape and as a result their period of usefulness is short and full of trouble, but the average plumber will look after his own tools in very commendable style, and it is no rare sight to see him grinding them into shape on the emery grinder in the shop after working hours, but I'll be hanged, if I ever saw a steamfitter repairing the boss's tools except on the boss's time.

Another thing, I do not permit strangers to come into my shop to cut a thread or two, as I have no means of knowing whether they know a pipe-die from a bung starter and I do not propose to furnish my tools to ascertain whether they do or not. This rule is in working order twenty-four hours a day, seven days to the week, and every week in the year.

As to fitting out extra men in rush times, I can fit out six or more any old time with A-1 tools and plenty of them; in fact this very morning I equipped two men for the fray and neither of them took out a tool that had ever been used before.

The intial cost of a kit of tools and also the up-keep is so small that individually it matters very little, but to the boss who has to purchase fifteen or twenty outfits the cost is considerable.

A percentage on the use of tools is also mentioned together with the fact that the boss usually arranges a certain price for the fitter, helper and tools; but believe me the charge for the tools is so insignificant that it is unworthy of talking about. However, should the mechanic have his own tools, he would get his percentage in the increased wages he would be capable of commanding.

Tools are not stolen in very great quantities, in fact, we have had but one loss this year, amounting to prob-

ably $5.00, and as we employ about 45 men, I do not think that it is worth while losing any sleep on that account. However, should any of my men (and I think there are other bosses who will look at it in the same light) who own their own tools suffer a loss by fire or theft, I should be perfectly willing to replace them for nothing.

As to the boss who is a tool crank, there is no question but that in case the men were buying their own tools that he would have absolutely no objection as to their kind and make, providing they would do the business. It is the finished job that counts, not the means.

Touching on our dear Uncle Ike, will say that in the past I have had several men transact a little business with the gentleman mentioned using my tools for the purpose of trade, but neglecting to make any returns to yours truly.

In returning tools from out-of-town jobs, a man owning his own tools would check them home as baggage or express and not trust to a freight with its delay. If the boss owns the tools, it is a case of letting the boss look after them himself with the result that the fitter gets home ahead of the tools and has to be fitted out with a temporary outfit.

Some bosses do not favor purchasing tools, and in this connection, I have in mind a large shop in this city, presided over by a former knight of the melting pot, where they still use the self-same solid dies and stocks that were used by this man when he was a cub fifteen years before, and it takes two husky men pulling their hearts out to start a thread on a piece of 2-in. pipe, with the result that a few threads will tire out the strongest man in the shop and his value is nil for the rest of the day. Inasmuch as this particular shop is a large one and as they cut all of their vent-pipe in the shop, it would seem like common sense to get a set of Beavers and a good cutter and do business right, or better still invest about $250 for a motor-driven machine and make the whole shop happy. Personally, I favor cutting vent-pipes right on the job, with easy-cutting adjustable stocks and dies, unless the job is right close to the shop, in which case I would use the power machine in the shop. Now, in my opinion, if the machanics in the above-mentioned shop owned their own tools, they would find that the continued use of them, in preference to those furnished by the shop, would lessen their work and prolong their working life so much that they would never think of taking up the old stocks again.

I contend that the plumber is not an easy-mark because he provides these tools for himself, neither would the fitter humiliate himself by acquiring an outfit along similar lines.

A concrete example may fit in here to illustrate my contentions:—In one of the big flour mills of this city, a foreman in the packing department having charge of about 300 men, found that they were always losing their hatchet or needle (these being their only tools) and as it was up to the milling concern to provide these tools, it caused a great deal of inconvenience and loss of time during the morning hours, as invariably from twenty to fifty of them would report in the morning that their tools were missing. Finally the foreman's ire was aroused and on one particular morning after every one had been provided with tools, he called the men from their work and informed them that from that day on the mill would provide no more needles and hatchets and that any one reporting for work without his tools would have to equip himself at his own expense and on his own time. Some demurred and were informed that they could quit, if they wanted to, but that the rule would stand. The rule stands today just as it was made, and there has been no more trouble on the hatchet-and-needle question with the result that all of the mills followed suit and both the employers and the employees are satisfied.

To sum up the proposition: A man owning his own tools or using the same tools at all times and being held responsible for them would take some pride in them, they would not be thrown in the dirt, they would be kept clean, they would not be misused, they would be kept sharp and in good repair, they would be locked up properly after working hours, and there is no question but that the workman would be enabled to do better work and more work with less effort and accordingly make more money for the boss and for himself as well.

Minneapolis, Minn. Squire Hotfoot.

THE THREE QUESTIONS ANSWERED.

Editor "Domestic Engineering":—Under the heading, "Three Questions to Be Answered," the following tells about how I would go about it, if I was placed in this position:

1. After arriving at the town, I would hunt me up a helper, then look over the material to see that it was all there, and in usable shape, then look the deacon's house over, and locate the radiators and boilers. I would then take a pencil and make me a rough sketch of how I was going to run my piping, marking the size of the mains and branches. Next I would check up my pipe and fittings to see that I had enough of everything to complete the job once I had started it, so as not to lose time waiting for material later on.

With this part straightened out, I would set the helper to straightening out the pipe and fittings, each size by itself, setting up the bench and getting the tools out as best he could under the circumstances. As he is new in the business, he will make some mistakes and retard the game some, of course, but it is the best and quickest way to learn him what to do.

While he is at this, I will put on my radiator valves and union ells, and get my centers, the radiators having been set in the different rooms when we located them. I would then proceed to cut my holes through floors and ceiling, for riser and branch connections. This done, I would go to the boiler room and with my helper set up the boiler.

I now proceed to run my main, beginning at the supply from the boiler; my hangers I have had the helper put up in the meantime.

After my main is run, I proceed to run my first-floor branches and hook them up to the radiators; I then run the risers to the second-floor radiators, then the branches to these.

Next I hook up my expansion tank, and then my water supply and the smoke-pipe, which I took the measure for as soon as I had the boiler set up. I now put on cement up to the joints around the boiler, fill up the system with water, and start my fire to test my circulation to see if there are no leaks showing.

With no leaks and circulation all right, I cover the boiler and pipes, paint up the iron work around the boiler, bronze the radiators and risers, tack up the printed instruction in plain sight of the operator of boiler, and put up several big nails to hang the fire tools on. Then I call in the Deacon and give him a full course of instructions of how to put in water, run the fire, keep his ash-pit clean and free of ashes, keep his fire-flues clean, ad-

just his drafts, shake the grate and vent the radiators at the air-valves.

He then assures me that he understands me perfectly and is satisfied with the job.

I now proceed to wipe up my tools, pack them up for shipment, get the odds and ends together of the material left over, and make a list of it to turn in to the boss, cart the whole thing to the freight house and get my receipt, pay my helper off, buy my ticket to the big city, and go in and report to the boss that I am ready to tackle the next job.

2. First thing you do is to tell the helper a few things, after you have asked him what he knows and made up your mind that he is worth taking along. Anyway, you take him to the job to give him a show.

After you have fussed with him for about two hours, you decide you will have to tie his hands behind him, to keep them out of his pockets two minutes or off the clean walls, you tell him a few things you did not tell him before, and in a little stronger language; after this he either wakes up and takes aholt, or when night comes he fades away, and you see him no more.

2. Own your tools? You bet. "A mechanic is known by his chips," is an old saying, and it is pretty generally true. It is pretty certain that if the journeyman did own his own tools, he would take more interest in them, keep them in better working shape, see that they did not get lost quite as often as they do now. He could accomplish more in a day with them and would be a more valuable man to the boss, also a boss could pick out a good mechanic from the tools he had in his kit and the condition they were in.

They would always be an asset, on which the mechanic could get a stake, if he had to. Good carpenters always have a first-class set of tools, and they usually get a little more than the scale and are given the steady jobs because of it.

Personally, I think it is to the steamfitter's and plumber's advantage to own all tools up to and including 2-in., the shop to furnish all vises, chain-tongs over 3-in. and all other larger cutting tools and wrenches.

In all large shops it is the practice to charge the tools of the shop up to the man using them, and those that are lost when he turns in his kit he pays for. So what is the difference?

Little Rock, Ark. A. J. Purcell.

THE OTHER SIDE OF THE FENCE.

Editor "Domestic Engineering":—The other day I happened to pick up a recent issue of your paper and had the pleasure of reading the department for the journeymen. Now I think that you have started a good thing, but that it will take some time to get it a-going in first-class shape, for the reason that the boys are quite slow to catch on to their advantages. Since you ask for remarks, I will send in a few. I hate to see so much sympathy wasted on the "poor journeyman." Take it from me that he is all right, if he wants to be. On the general run of things he can get enough work to keep going, and if the season is a little slack he can find something to do at various side-lines to bring in the dollars.

The way I look at it, he is a blamed sight better off than many of the so-called masters who have regular shop expenses to meet and little coming in with which to meet the bills. I believe that the journeyman has only one master to serve, while the master has many, and until I can see a good bunch of money, where I can lay my hands on it to command, I prefer to remain a journeyman. A good, reliable, resolute journeyman, holding his own in the world, to my mind, is a much better example of productivity, than some of the masters who are straining at a gate and swallowing the saw-mill every day of their lives. I will try and send you some more in the course of a few weeks. "Carrotts."

WANTS TO BECOME A CRAFTSMAN.

Editor "Domestic Engineering":—I have a chance to see your paper once in a while, and so I thought that I would take advantage of your offer and ask a question that interests me very much.

I have had very little experience as a helper in the plumbing trade and have made up my mind that I would like to learn it, as it looks good to me. What I want to ask you is this: Would it make any difference if I learned it in a shop that was connected with some hardware store? I have heard that a good many plumbers were "sore" at the hardware people because they did plumbing and gave them the bad end of it whenever they could. If you will print this in the paper, I should like to hear from some who can tell me about the matter.

Helper.

SUDDEN DROP IN TOOLS.

—"The Arkansaw Traveler."

A Night Journey.

The triplane, making a twelve hours' journey from London to Hong Kong, had got into difficulties among the stars. Something apparently was wrong with the engine, for the customary speed of the airship had suddenly and considerably slackened.

"Good heavens," cried the skipper, "we shall be half a second late! What makes her go so slow?"

"Why, sir," replied the engineer, "we're passing through the Milky Way, an' the propeller's full o' butter!"

INSULATION.*

By W. E. Richards, Toledo, O.

Insulation may mean many things and calls to mind a certain element or condition, depending on the training of the person. But on this occasion I wish to speak of it in relation to temperature.

We insulate our bodies from the cold by clothing, and, paradoxical as it may seem, we insulate these same bodies from heat by clothing.

We are digressing and will here enter an apology by saying that this paper is presented with regard to bringing up wholesome discussion rather than any new principles or startling statements.

Fundamentally, we find that confined air (dead air) is our most practical insulating element; also, to divide the air into small particles is the most efficient form. To accomplish this has occupied the time and ingenuity of many engineers.

From the standpoint of the heating engineer we have several conditions that enter into this question that will call for different styles of insulation for different uses. To keep the air in perfect imprisonment by material proof against decay and destruction is the ideal, and we are today enabled to meet as operators of district-heating systems only because of the degree of perfection of our methods and materials of insulating.

District-heating was first started about 40 years ago and its apparent failure, in fact, dormant condition, was due to lack of proper knowledge and methods of conserving heat, meaning insulation.

We are today extending the operations of district-heating partly due to economic demands and also improved methods of transportation.

We could amplify this subject largely were we given the time to prepare it and did you have the time and patience to listen, but I have at least a faint suspicion that there are few here who are not as well, if not better, posted than I am.

But to call your minds to conditions to criticize—to assist and adopt the best for each special application.

In the steam-heating line we have various forms of insulation—construction of mains and its material. We have the well-known tunnel, which is an enlarged conduit. We have the well-known wood-log, which has its apparent merits. We have the concrete duct and the vitrified-tile construction, and along with these as protection to the wrought iron and steel pipes which we surround with the above, we have the five principal pipe coverings—magnesia, asbestos, wool felt, mineral wool and air cell. All have their special qualities, which, under certain conditions, become paramount above the others.

To show to what extent the improvement of insulating has progressed, we need only to state that manufacturers of insulating materials will garantee to protect steam-mains to that degree that they can run steam at 50 lb. pressure one-half mile with not over 2 deg. drop.

In steam-heating we are compelled to use an expensive construction for installation on account of the exceedingly low specific heat.

To rob steam of 20 deg. of heat, when considering exhaust steam at low pressure, is not a difficult problem—in fact, not to do so was until recent years the main point, for if that took place you had condensed steam (water), and at the same time excessive loss, if not failure.

In hot-water heating we have a reverse action—in a way; for while steam, the gaseous condition of water, is very low in specific heat, water, the liquid condition, is very high; in fact, the highest of our common elements, eight times that of iron.

In laying hot-water mains with the forced circulation, they are laid just under the surface, not to grade, hence take the contour of the surface, and are therefore subject to some moisture and occasional floods due to lack of proper drainage, etc. This is more because the well-known wood-box construction is used. There are several causes for this: necessity for low installation cost; high specific heat, eliminating excessive or disastrous losses; reconstruction or extension additions; reduction in life of pipe with water as compared to steam; in residential districts the increase of houses and changing of this phase by new buildings and changes resulting.

From the writer's standpoint an insulation, subject to knocks or jars, or excessive moisture, calls for wool felt; it can be met, so far as moisture is concerned, successfully by waterproofing, but this at added cost, and for hot-water mains is a debatable point.

Magnesia and asbestos seem to hold the place on high-pressure steam and, of course, maintain a prominent position in low-pressure work.

A concrete construction, complete with wool-felt lining for hot-water main, with feed and return main of 4-in. pipe, will cost approximately complete, as a main, with expansion joints, anchors, in fact, complete, $6.00 per ft.

A triple wood box, with shavings, main same as above, will cost 35 per cent of same, or about $2.00 per ft. Now, without decrying the concrete construction, which is good, and for steam is probably one of the best, to effect the 65 per cent difference and to be sure of reasons to adopt either is worth knowing. Should we make our conduit to outlast the pipe, and how much longer will we prolong the life of the pipe with the permanent duct over the wooden box?

In taking up the heating system in buildings, the question comes up about installation, and we have this matter presented to us from two points of view. One is from the heating company, and the other is from the consumer or owner.

As a rule, most heating jobs will have a certain amount of exposed piping, which will vary from 20 per cent to 30 per cent, or even higher; that is, the heating surface of the mains will equal the amount approximating 20 per cent of the installed radiation.

These mains, uncovered, dissipate the heating from the element in the mains, either hot water or steam, and are of such importance from this point of view that the manufacturers of heating equipments specify that their apparatus is booked for so many feet of radiation, including all uncovered mains.

In the basis of contracts from the heating company's standpoint, where the flat rate is used, which is practically universal for hot-water district-work, and also to some extent on steam heating, they insist on recognizing those exposed mains, unless the same are covered.

When the contract is on the meter basis, the consumer, from a matter of economy, is immediately transferred to the former position, and he proceeds to have these mains covered, so that indirectly the results are the same, and insulation becomes our friend to the extent of giving us economic relief from excessive losses.

*Paper read at the second annual meeting of the National District Heating Association, held at Toledo, O., June 1-3, 1910.

A PLUMBER'S DIARY

BY PHOENIX

XXII.

An Experience With the "Home Guards."

When a fellow strikes one of these "home-guard" towns, he certainly is due to get a run for his money, provided he lands any of the cash at all. In by-gone days I went to work in a town that had these earmarks plastered all over its corporation too plainly to be mistaken. A body couldn't set his foot inside of a shop but what some one in the back-room would be "rubbering" and running to tell some one else, all apparently "scared of their job." If you'll stop and think for a moment, you'll wonder what so many were doing in the back-rooms at all hours of the day.

I got hep once when I heard a party say, "I wish I had a little leak to fix right now. I'd make it do me $4.00. Case of "make 'de job last" you see. When you strike a town like that and try to butt in to get a piece of money the feeling comes over you that you ain't got a right to live. "O hell, what's de use? let's get out. There's other places," said one plumber to me as we ran up against each other on an almost endless journey through that blooming town looking for a place.

"Not on your life," I answered. "The work is here, we are here, and I am going to pay the expense of "arriving." So I continued to "hike" around the city from shop to shop. Taken as a class the plumbers and the fitters are about the "glummest" class of men ever. It reaches up into headquarters and the boss seems to follow the same undesirable style.

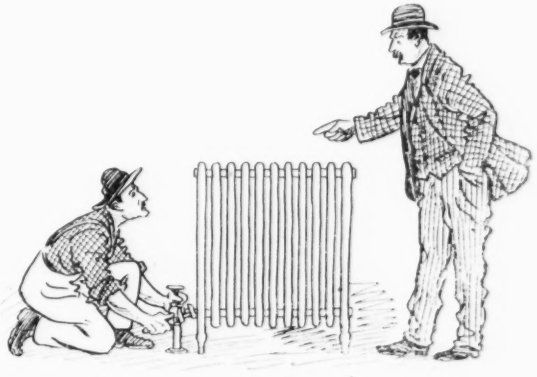
Whisper! Did you ever hear a plumber sing while at his work? I have, but it was three or four times only in the course of twenty years. There must be something radically wrong with either the trade or the men in it, when they cannot be happy and contented while at work, or on the outside. I am going to say right here that the majority of the "bunch" is not happy, neither are they contented. Constitutionally they are what we call pessimists. To quote a well-known phrase, "there is a reason." I think that it can be found in the mention of one word and that is the word "uncertainty."

Once, back East; (this did not happen in the Land of the Pilgrims); I think it was in Asia, but never mind. There was a man who had all good things that he wished. "Irish stew and raisin pie for breakfast" cried he. And it came on the run. "The infernal revenue tax at once" he yelled, and it was done. That was the kind of swell style in which he lived. One day he happened to look upward and directly over his head there hung suspended by one hair a reducer of surplus population, viz., the king's sharpest sword. That fellow is reported never to have had a happy moment from that time on. The uncertainty of life soured his disposition. Ever go out in the cold, grey light of a foggy morning, about six-thirty, to get an early start so as to be the first to strike the shop that you wanted to land a job in?

Cheerful, wasn't it? And when you got there the boss was probably busy laying out his plans for the day and you stood around until he was entirely ready to notice you. All the time he was probably sizing you up, or at least thought he was, for they fall down sometimes on this sizing-up proposition. "Anything doing for a plumber?" says you, most anxious-like, the quality of the tone depending somewhat upon the "needful" that you had saved up. "Nuthin' doin'," he replies. That's enough. You move on.

Maybe he is a little kind-hearted and says: "Gimme your address and name, something may come up." It seldom does, being another case of never-come-back-atude. "The foreman hires all the hands," says the peroxide typist of another shop. "Go out to 5982 on 36th street and ask for Mr. Soakum. Maybe he can put you on. I heard him say last week that he needed more plumbers." On the strength of a last God-forsaken hope you take a shot at Mis(s) Chance and hit the pike for "De works," arriving at the end of the "drill" about completely done up. "Why yes," says Soakum, when you find him and make your wants known, "I can use another hand. Come on tomorrow morning." You can see all those 27 bucks for the next week's work right in your pocket at once, can't you, and you ride back to town on the street car. Darn the expenses, anyway, now. Before that you hung on to the nickel.

So I landed a job at last. Went out the next morning and was put to work "stubbing up." I don't know what



"I know a Day's Work When I See it," He Said.

kind of a crazy loon had hold of that part before, but I do know that about two out of three offsets were wrong. So the work went slow. The second day one of the home guard happened along my way and said "de boss is easy, take your time."

I fell for it! I was younger then. That fellow would have a glorious time trying to put it across on me today. Well the result was that I took the hint and slowed down my efforts about 60 per cent.

It worked out exactly as the home guard has foreseen. At the end of the week the boss called me aside and

gave me "my time." "I know a day's work when I see it" he remarked.

So it is best to look well before you leap. Consider matters from both sides of the fence and act accordingly. All folks don't see things from the same standpoint.

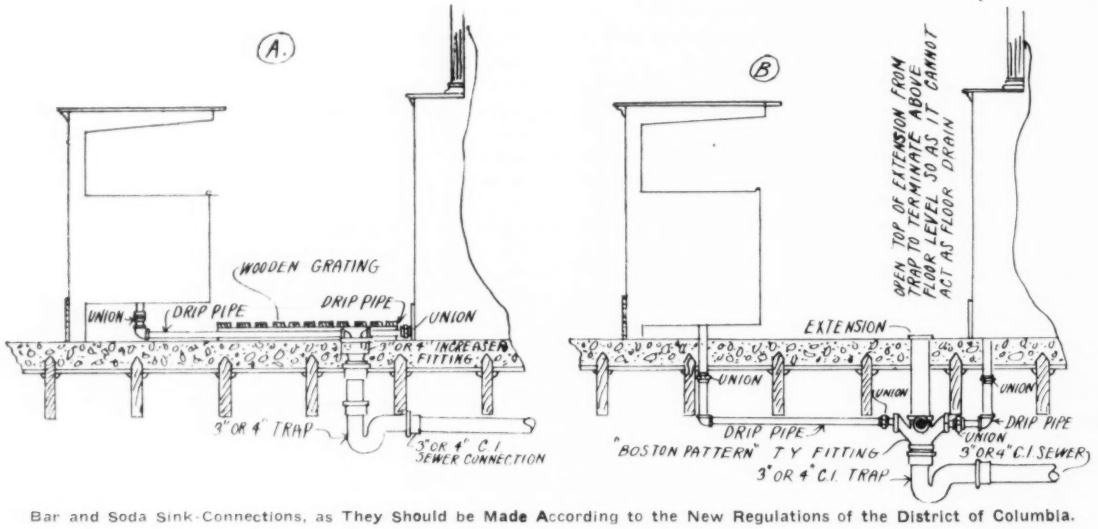
"You wouldn't tell about being 'fired' if you was me? Why not? It's by considering the things that we have 'fell down' on, that we improve. Rectified mistakes count some. When a man tells me that he has never been fired while at his business I've got his number. He's the first cousin to the man who sits way back in the revival meetings."

BAR AND SODA SINK-CONNECTIONS.

The recent regulations regarding the installation of bar and soda sink-connections in the District of Columbia is illustrated in the accompanying drawings, and as a matter of information the following extract from the code is made:

"Section 84: * * * The waste from every such bar sink or soda fountain sink * * * shall discharge over a properly vented trap located as near as practicable to the fixture; provided, however, that when the connection (waste) is not less than 3 in. in diameter, and is taken from a point on the house-sewer line in such manner that it is between the public sewer and an extension of the sewer-line as a vent, a deep-seal trap may be used and the vent omitted. In every case an open extension of the intake end of the trap shall extend above the floor-line in an accessible position and in such manner that it will not be used as a floor-drain. Drip-lines shall be of size and material designated by the Inspector of Plumbing."

Drip-lines may be of rough or finished brass tubing with recessed fittings brazed on, or may be of galvanized-iron with drainage-fittings and any size desired by the owner provided it is not less than ¾ in., and is provided with unions, couplings, etc., so that they may be readily taken out for cleaning.



Bar and Soda Sink-Connections, as They Should be Made According to the New Regulations of the District of Columbia.

The city council of Wilmington, O., has adopted a resolution declaring it necessary to construct a water-works plant at Wilmington to cost about $100,000.

NEW PUBLIC-COMFORT STATIONS FOR COLUMBUS, O.

A bill favoring the establishment by the city of Columbus, O., of a public-comfort station in the state-house grounds is being prepared by City Solicitor Weinland for introduction in the state legislature this winter. The bill, if passed, would give the city certain ground upon which to erect the station at its own expense. A former bill, which attached the expense of building to the state, was defeated last winter.

It is the plan of the Marshall administration to establish comfort-stations at Goodale park, Long street and the state-house grounds, also using the one now at Union station.

The sinking-fund trustees lately have accepted the $15,000 in bonds for the erection of the Goodale-park station, and plans for a combined comfort-station and shelter-house are being prepared. The ordinance to build a station on West Long street is still being opposed bitterly by business men.

A WATER-HEATER CAMPAIGN.

It would occur naturally to the observer that in Pittsburg, the art of washing oneself should reach its highest stage of development. Washing in Pittsburg means the use of plenty of hot water and hence the prosperity of the Pittsburg Water-Heater Co. This company having adapted its products to the manifold requirements of the Great Unwashed of its city, has undertaken by a vigorous campaign to extend the knowledge and use of its heaters in fields near and far. A special success was made in the case of a mammoth apartment building, known as the Collinwood Apartments, in Kansas City Mo. The hot water for all the numerous kitchens and baths of this great structure is furnished summer and winter by the company's "chauffeurs." The company states that in this case it has been demonstrated that one cent's worth of gas will heat 40 gal. of water.

The company's campaign has extended even to Switzerland, the land of the yodel and the alpenstock. American and English tourists can now find in their hotels hot water for washing purposes where previously an icicle was formerly supposed to do duty as both soap and water, the tourist furnishing his own animal-heat. Friend Blackiston, the company's word-picture artist, and stereoptico-graphonical merit-impressionist, says William Tell would have had more to Tell if he had been sustained by the comforts of a Pittsburg water-heater bath.

The Grand Rapids Plumbing & Heating Co. has opened an up-to-date establishment at 410 N. Ionia St., Grand Rapids, Mich.

Retail Reconstruction

What Manufacturers Are Doing for Merchants

SOME INTERESTING EXCERPTS ON THE PLUMBING AND HEATING BUSINESS FROM AN ARTICLE IN THE "SATURDAY EVENING POST" BY JAMES H. COLLINS. THIS SHOWS HOW THE PLUMBER IS BEING PORTRAYED TO THE PUBLIC BY THE PRESS.

Only twenty years ago the bathtub was still a luxury in this country, as were also sanitary fixtures generally. The whole art of the present-day plumber was yet in development. Porcelain tubs were just beginning to displace the copper-lined article, cast-iron sinks did duty in kitchens, and the potteries were experimenting with the fine vitreous fixtures of various sorts that are now so common.

Had the farmer of 1890 shown a disposition to install even the old-fashioned copper-lined tub in his home, as he is installing porcelain fixtures today, it would have worried Wall Street as much as do his 1910 purchases of automobiles. Wall Street would undoubtedly have scolded about the extravagant bathtub craze, that threatened to limit the farmer's credit, and predicted that he would eventually bring disaster on the country.

About this period a large company making sanitary fixtures saw far enough into the future to discern a universal demand for porcelain bathtubs, and began to prepare for it. Manufacturing processes had reached a point where a good porcelain tub could be placed in the average American home at reasonable cost. At the same time, standards of living had advanced, and the public was interested in the conveniences of modern plumbing. Supply and demand were both there, and it only remained to bring them together. But a difficulty lay between them.

How Modern Plumbing Got Its Start.

Bathtubs were sold and installed by plumbers, and the plumber, no matter what his skill as a workman, had only moderate ability as a salesman and merchant. Rising from the ranks of the journeymen, and dealing chiefly with architects and builders, his shop was usually a mere storeroom for tools and supplies, perhaps in a dark basement. The customs of his trade led him to seek large contracts—installations in public buildings, institutions, big hotels and fine mansions. In thousands of comfortable homes all over the land were old-style bathtubs, with pipes hidden away behind sheathing, in most cases easily replaced with porcelain fixtures and open piping if some plumber proposed it and quoted a price on the job. Likewise, thousands of modest homes being built yearly could now afford modern bathroom conveniences. The public, however, had a notion that the cost was much higher than it really was, while master plumbers gave little attention to this class of business because it never came before them in the shape of an invitation to bid. Big contracts, which tied up his capital for long periods, and sometimes broke him if he figured wrong, were sought by the master plumber because of the size of the figures involved. The little two-hundred-dollar job of the ordinary householder looked small in comparison, and the plumber did not yet realize that it was possible to build up a business on hundreds of such jobs, tying up little capital, getting a decent margin on each installation, and playing no politics. As a consequence, he had no showroom where a householder might see a few different styles of tub and fixtures in place; the best the plumber did, usually, was to show him catalogs and help him order from pictures.

When the aforementioned company began advertising modern bathroom fixtures to the general public, demonstrating that the latest conveniences could be had at moderate cost, there was immediate interest on the part of the consumer. Hundreds of inquiries came in. Master plumbers were apparently indifferent to this new demand. They could not be persuaded to go after the small installations in a whole-hearted way, and did not catch the significance of what was being done. The company soon saw that the trade gap between manufacturer and consumer would have to be bridged.

So prizes were offered master plumbers for the best model bathroom installed in their shops. These prizes were substantial sums in cash, divided so that plumbers of every sort all over the country could compete. The contest appealed to the plumber's pride in his technical skill. Model bathrooms began to appear in plumbing shops everywhere, and as soon as a master plumber sent in a photograph of his prize installation he was entered upon a list. Every householder who wrote from his town asking for further information about a new bathroom was told to go to that plumber's shop and see the newest fixtures arranged in a model bathroom. At the same time the plumber was notified and given the inquirer's name and address to work on from his end. By the time this contest ended, and the prizes were awarded, half the master plumbers in the United States had learned the value of having fixtures permanently on exhibition in their shops, and the model installations were made permanent and extended, and in many cases shops were moved to new quarters where fixtures could be shown in windows.

Investigation also showed that the master plumber, out on jobs most of the time, usually kept his accounts in a hurried, primitive way. Much of his profit leaked away through this slack bookkeeping. His methods of keeping costs and making estimates were very often based on rule-of-thumb, which meant more leakage. So one of the best accountants in the country was commissioned to devise a simple, effective system of accounting for the master plumber, based on his own business, and covering costs and estimates. This system was published in installments at first, but eventually issued in book form, and hundreds of plumbers frankly said that it had taught them how to do business. A monthly periodical also was established by the company, giving excellent technical articles, showing the importance of the small household installation in the growth of the plumbing business, and pointing out methods of securing such jobs.

Nowadays the master plumber is a merchant as well as a craftsman. His storeroom in the basement has been abandoned, and he has an ample showroom in the shopping district instead, with a good window display and model installations to show customers. The variety of fixtures he carries has grown amazingly. Even the thousand-dollar cottage and fifteen-dollar tenement now have

enameled bathtubs, the kitchen fixtures in the average home are porcelain, stationary washtubs stand in the laundry, lavatories and showers are scattered through sleeping-floors; in fact, the plumbing has become so important that it practically turns the decision in selling or renting property, and during the past fifteen years our output of plumbers' supplies has more than doubled.

The world of retail trade is today going through a revolution not unlike that taking place in the political world. In each case the causes are much the same. Both merchant and politician are being hurried into a new era as cheap food and cheap votes are left behind. The public has been thinking seriously about themselves and their responsibilities. Higher standards of service are demanded, and new principles and methods are emerging everywhere.

Retail merchants in many lines of trade have been a bit slow to see the new drift of things, and it has been necessary to go after them vigorously, as in the case of the plumbers, showing how to link up with the consumers's demand.

A story of a stove manufacturer. Hampered in the development of his business by hard conditions due to price competition, he sought to escape by marketing an improved cooking range under his own trademark. The first three ranges of this type completed were sent to a hardware dealer in a near-by town to see whether the public would take to them. Several weeks went by, and one morning the hardware man reported that he had been able to sell but one of those new ranges, try as he would.

When the stove manufacturer heard this he went to the hardware store. There stood his two stoves, back near the alley door. A woman came in and said she wanted to look at cook-stoves. A clerk led her to the rear of the store and then asked languidly:

"Do you know about what style cook-stove you want, ma'am, or how much you expect to pay?"

Before the customer could reply the stove man, who had been watching matters, elbowed the clerk aside, guided the woman up to one of his ranges, jumped on top of it and danced up and down.

"Madam," he declared, "you never saw a range like this. When you and I are dead this range will still be working for somebody."

Point by point he went over it, showing how the arrangement of drafts and oven gave superior baking facilities, and pointing out the many conveniences that made cooking easier. He assured her that with this range in her kitchen she could bake for her husband that very day the finest batch of hot biscuits she had ever set before him.

"Why, you don't mean to tell me you could put this stove in my kitchen that quick?" exclaimed the woman.

"We will put it there this afternoon," said the stove manufacturer, "and it will be a pleasure to do it." And he did.

The manufacturer has made a fortune out of his ranges since then, and they are synonymous with high quality all over the country. He is a first-rate salesman and business man. If he were sent out to sell bonds, Western apples, steel rails or automobiles, his yearly commissions would undoubtedly exceed the gross sales of the average retail merchant. So his problem in marketing that range has been to give the retail merchant with ten thousand dollars turnover, and his fifteen-dollar clerks, as much of his own ability as possible.

This is the problem of thousands of other manufacturers nowadays, and it is being solved in ingenious ways.

SEWER AIR.*

The popular fear of sewer gas is based not so much upon its direct poisonous action as upon its possible relation to communicable disease. For generations the belief has prevailed that typhoid fever, scarlet fever, diphtheria, etc., were induced by inhalations of sewer air from leaky plumbing fixtures. Since the day of bacteriology, doubt was cast upon this theory of disease communication. Now it is known that these diseases are due to specific germs. Every case of a transmissible disease is due to some prior case. It is difficult, in many cases, to trace the infection to its origin through certain contact or media. A very important question is, does sewer gas, as it escapes from defective plumbing systems or from the city sewer, act as a medium to transmit infectious germs to be taken into the human system by inhalation?

This question has been the subject of much research work on the part of scientists. A valuable contribution to the knowledge of this subject is due to the investigations of the sanitary committee of the National Association of Master Plumbers. Under its direction, Prof. C. E. A. Winslow of the Boston Institute of Technology conducted a series of laboratory investigations. Investigations were begun in 1907 and a final report was made two years later.

Only a few conclusions can be given. The professor says: "In the whole series of 200 liters of air collected from the most diverse locations on nineteen different plumbing systems, not a single sewage organism was found except where the air was exposed to immediate local infection by fine particles of spray." * * *

"Actual examinations of the air in sewers, however, by Miquel in France, Petri in Germany and Carnelley and Haldane, Robertson and Laws and Andrews in England, showed that sewer air, as a matter of fact, contains very small numbers of bacteria and those of types common in street air rather than in sewage." * * *

"In general my results confirm the results of Horrocks in so far as they show that specific bacteria may be ejected from liquids into the air above. My tests of house-drain air, like those of Carnelley and Haldane and Laws and Andrews on sewer air, indicate that mechanical splashing may produce a local infection of the air in immediate contact with the spray. Such an infection does not, however, extend for any distance or persist for more than a minute or so. I found the general air of house-drainage systems singularly free from bacterial life. Out of 200 liters examined, only 48 contained any organisms capable of development at 37 degrees. Sewage bacteria were found in the air of the house drains only four times out of 200 liters, and then in the presence of mechanical spraying of sewage at the point of collection. The general air of the house-drainage system, aside from this local infection, was, as far as examined, free from sewage organisms." * * *

All investigators testify that under certain conditions, as splashing of liquids and bursting of bubbles, sewage bacteria in small number are allowed to escape into sewer air. It is also admitted that the liberation of bacteria from dried sewage adherent to the surface of pipes, by means of air currents, is to be considered. In the light of scientific research, under ordinary conditions, there is little or no danger from sewer gas as a vehicle to transmit typhoid or other pathogenic germs. Sewer air, like other foul and impure gases, for physiological reasons, is to be avoided as detrimental to health.

*From the September bulletin of the Columbus (O.) Board of Health.

PREVENTING CORROSION ON IRON SEWER-PIPES.

Editor "Domestic Engineering":—Sometimes the earth, in which the iron sewer-pipes are laid, seems to have a tendency to destroy the pipes. In what manner can these pipes be fixed so that they will not be affected, or at least not affected to the extent that they now seem to be?

S. M.

We find that when the pipes show instances of such danger, it is advisable to paint the pipes on the outside with asphaltum and afterward enclose them in concrete.

AMOUNT OF GAS CONSUMED BY A GAS STOVE.

Editor "Domestic Engineering":—In trying to sell a gas-stove the other day, it so happened that the customer was very anxious to know just how much gas the stove would use each month, and how much it would cost. I have never gathered any figures upon the subject and would be much obliged if you could give me any pointers along this line.

V. G.

In an average family and under the usual conditions we should figure that from 2,000 to 3,000 cu. ft. would be used each month. From this, and knowing the price of gas in your town, you can figure out just the amount that the gas-range would consume. In families that we are acquainted with the bill runs anywhere from $1.40 to $2.50 per month.

ESTIMATING THE WATER CAPACITY OF A ROOF.

Editor "Domestic Engineering":—How are you going to get at the size of the conductor pipes on a roof of moderate size? Any information on the subject will be appreciated.

C. D. E.

When you look at the weather reports you will see it mentioned like this: "one half an inch of rain fell"; or may be it was "one-quarter of an inch." That means the amount of rain that fell upon a certain given space and no allowance made for evaporation or soaking away.

Now, if you have any way of finding out how many inches of rain fell (in absence of which you may find out what the average amount of rainfall is for your locality), it will not be a hard matter to find out just how much rain falls upon the roof.

Find out the number of square feet of roof-surface that you have and multiply this result by 144 and you will have the number of square inches of surface. Then if one inch of rain fell, the result would mean just that number of cubic inches of water.

If you divide the cubic inches by 231 it will give you the number of gallons that fell upon the roof for any given period of time that was mentioned. You have your tables of the carrying capacity of pipes, and knowing what you now do of the problem, it will be an easy matter to find the size that will be proper for the amount exposed.

AMOUNT OF WATER USED PER PERSON FOR DOMESTIC PURPOSES.

Editor "Domestic Engineering":—If you have the information handy, will you kindly tell me in the next number of your valuable paper the amount of water it is estimated that each person will require in the general run of domestic use, and greatly oblige,

"A Reader."

We have seen various estimates upon the subject. It would depend somewhat upon the carefulness and desires of the occupants; but probably anywhere from twenty to thirty-five gallons would come quite close to the mark. In estimating it would be safer to take the larger amount in order to be perfectly sure in the matter. If the city supply is somewhat limited, the water commissioners might have something to say as to the amount of water allowed to be used.

WHERE TO LOCATE.

Editor "Domestic Engineering":—Before next season opens I am going to open a plumbing and heating establishment. As you have a large extent of territory covered and are more or less in touch with the trade all over the country, I wish that you would tell me what you consider the very best location.

C. G. B.

We think that it would be hardly fair to any particular locality to give such publicity as our friend would have us. If from four to ten took our tip and started for that town and went into the business we believe that it might make a corner on the work at that place. A few observations might be to the point. Look for a town containing a prosperous middle class of people. A town that has a productive farming country surrounding it or a town that is a good distributing center. There are hundreds of such places in our country. Perhaps you do not need to move away. Why not look over your own place first, and see if the shops there are run on first-class business principles? Get out around the town and find out how many people have good jobs and how many have no modern plumbing at all. Examine their financial condition and after several days of investigation you may decide that it would be good policy to stay right where you are. The matter of where to locate will stand all the thought and investigation that you care to give it.

CLOGGED SEWERS AS A SOURCE OF AMUSEMENT.

Editor "Domestic Engineering":—I see where a reader read with considerable amusement regarding those clogged sewers, and I read his news with as much amusement. He seems to think that if the pipes were cemented well, roots would not get in them, but if he will come down here in Florida for a little while, he will change his mind. I have seen sewers clogged up solid for 25 ft. with roots; sewers that have been well cemented and the cement was so hard that the pipes would break before you could get them

apart. The roots would go right through cement as hard as stone. Orange-tree roots and Bermuda grass are what give us trouble here and we have a lot of this where they grow. I have been in the plumbing line a good while and in a good many states, but never saw this trouble anywhere else. It amuses me to read some of the views of some who surely were never about much, as expressed upon some of the problems that come out in your paper.

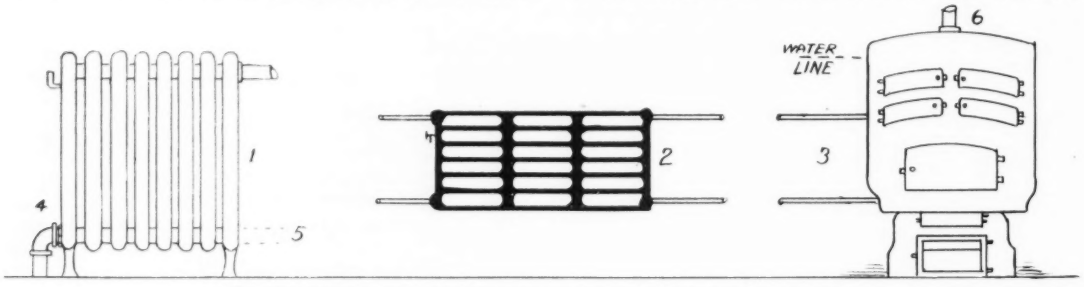
St. Petersburg, Fla. C. J. G.

STEAM AND HOT-WATER HEATING COMBINED.

Editor "Domestic Engineering":—Will you be good enough to give me a few pointers on a combination heating plant of steam and hot-water? Thanking you in advance. A. H..

An installation of this kind was given by "Phoenix" and published in this paper in issue of April 16, 1910, with illustrations which we reproduce for the benefit of our correspondent in connection with an abridgement of the article published at that time.

The boiler is shown as being tapped out about 10 or 12 inches below the water-line for the hot-water connections for the hot-water radiators. No. 6 shows the steam connection for the steam main. No. 2 shows hot-water connection for a wall-radiator. The radiator shown by the figures 1, 4, and 5, represents a manner of connecting that, in this case, Mr. Phoenix states, was found to work improperly and it was changed after the fashion of number 2 and then worked all okay. This is not a new manner of heating as it has been practiced in various places in the country for many years and has worked successfully.



Some Details of a Combination Steam and Hot-Water Heating System.

PUSH-NIPPLES OR SCREW-NIPPLES FOR VACUUM-WORK?

Editor "Domestic Engineering:"—We were informed today by an architect that he understood, on good authority, that all leading authorities on vacuum-heating, and especially contractors setting vacuum-work extensively, were opposed to push-nipple radiators, claiming they were not nearly as reliable, and hard to maintain their vacuum on, and that they were quite generally favoring screw-nipple connections.

This was a new one on me, and came up owing to the fact that on a certain job where I had figured radiation and vacuum-system, I had figured push-nipple radiators. I am rather of the opinion that the matter came up by the representative of a screw-nipple radiator making this claim. This controversy arose owing to the fact that a representative of a screw-nipple radiator struck here when a job was being figured on vacuum-work, and I am certain that the criticism of the architect followed his claim that push-nipple radiators were not suitable for vacuum-work, yet the same people make a push-nipple boiler, and my honest opinion is that a good push-nipple radiator makes a tighter joint than the average screw-nipple, especially a right and left screw-nipple for such radiators depending largely upon the gasket really making the joint. I would like to hear the views of others.

Saginaw, Mich. Inquirer.

HOW LARGE THE STEAM COIL SHOULD BE.

Editor "Domestic Engineering":—I notice a question from B. J. T., of Port Henry, N. Y., on page 68 in the Oct. 15th issue, and your answer to it, and in reading the article over, it occurs to me that our friend really wanted to ask how to heat 400 sq. ft. of radiation with hot water, using a storage tank with a steam coil in it as a generator in place of a hot-water boiler.

Presuming that such is the case, it will figure about like this: 400 sq. ft. of radiators will contain about 400 pints of water, which equals 200 quarts or 50 gals. of water. To this add the 50 gals. more, which the pipe and storage tank will contain. This makes a total of 100 gals. that we will have to heat to 180 deg. with a 1¼-in. pipe-coil in the storage tank. Steam at 50 lbs. pressure has a temperature of 287 degs., and after the water is once heated to 150 degs., we will figure that the constant rise in temperature will be only 30 degs. or that the water will cool that much in traveling through the 400 sq. ft. of radiators and the piping, and we will need steam coil enough to raise it again to 180 degs. This gives us 287—30 equals 257. 100 gals. water will weigh 830 lb. We have now reached the point where we apply the rule which reads as follows:

Rule.—To find the heating surface required to heat a given weight of water per hour by a steam coil, multiply 1.25 times the weight of water, in pounds per hour, by the required rise in temperature of the water, in degrees Fahrenheit. Divide the product by the product of 300 for copper pipe, or 200 for wrought-iron pipe, and the difference between the temperature of the steam and the average temperature of the heated water. The quotient will be the required heating surface, in square feet.

Thus our example will read:

$$\frac{1.25 \times 830 \times 30}{200 \times (287\text{-}30)} = 6.03 \text{ sq. ft.}$$

And dividing by the factor 300 we get 4.03 sq. ft.

2.3 ft. of 1¼-in. pipe equals 1 sq. ft. of heating surface.

$$\frac{6.03}{2.3} = 13.869 \text{ lin. ft. of wrought-iron pipe.}$$

$$\frac{4.03}{2.3} = 9.269 \text{ lin. ft. of copper or brass pipe.}$$

Little Rock, Ark. A. J. Purcell.

PLUMBING AND HOUSE DRAINAGE.*

The importance of plumbing is not generally understood. As a mechanical art it involves a study of pneumatics, hydrostatics and sanitary engineering. It is concerned with metallurgy on the one side and architecture on the other. It requires a knowledge of ventilation and drainage. It is related to sanitation. These requirements enter into the qualifications of a master plumber. He not only knows how to "wipe a joint" as a mechanical artisan, but works in terms of technical knowledge as a scientist. He knows the cause and remedy of "water hammer" and the siphonage of traps. Head and hands correlate to effect good plumbing. The sanitary plumber is both scientific and mechanical.

Plumbing is but the terminals of the city sewer. The foulest part of the entire sewerage system of a city is within the buildings and homes. Whenever a city sewer is tapped to serve a dwelling, an element of danger is brought into the house. Sewer gas is ready to escape through any attachment of pipes which serve as so many ventilators. Plumbing at once becomes sanitary or insanitary.

Sewer gas is not now regarded as a vehicle of contagious and infectious diseases, as it was before the days of bacteriology. Whether regarded as a source of possible danger of infection through inhalation of sewer gas, or simply as an insult to the olfactory sense, it is important that all sewer waste, liquid, solids or gases, be removed from dwellings by a system of plumbing. The solids and liquids must be conducted downward and the gases upward. This implies the necessity of perfect plumbing. One system of pipes conducts the heavier wastes to the sewer, and another system carries the foul gases from waste pipes and sewer to the open air above the building. This means that all plumbing fixtures, traps and waste pipes, including the soil pipe, must be ventilated by an independent system of "vent pipes" to carry the noxious gases out through the roof. This dual system of pipes must be so constructed as not to allow the escape of gas, liquids or semi-liquids. The workmanship and material must be good or the results will be bad.

It is evident that plumbing, being a business in relation to the comfort and health of the public, should be regulated by official authority. In consequence, all cities adopt plumbing rules and employ inspectors to enforce them. This is absolutely necessary in order to provide against poor workmanship and bad material. Furthermore, most cities provide a board of examiners to determine the qualifications of both master and journeyman plumbers. A license to conduct the business of plumbing and drain-laying is thus based upon the garanteed ability of the licentiate. In addition, to insure every job of plumbing, as being safe and sound, the plumber is required to take out a permit to do the work. This permit is conditioned upon the submission of plans and specifications and their acceptance by the plumbing authorities. If faulty plans are submitted, permit to do the work is refused. In this way plumbing work is not begun unless upon the assurance of approved plans. Permits also require that official inspections be made before the work is covered and again when the job is complete. Tests are made by means of air, smoke or volatile oils to determine the integrity of a gas and water-tight system of plumbing before the official seal is placed upon the work as a garantee to the owner and householder of a perfect job.

*From the September bulletin of the Columbus (O.) Board of Health.

Speaking of some plumbers, the temptation to pool issues with the professional builder, working through lowest bids rather than through official regulation as the more profitable, are so promising that the plumbing code is looked upon as a great hindrance. Another tendency to laxity of official regulation is the fact that many owners in constructing a home give least and last attention to the plumbing. This is fitted into cubby holes as an afterthought. They know little of scientific house drainage and accept the lowest bid as they might accept eyeglasses from the street fakir because of the low price The lowest bidder has a mental reservation of some value —to himself.

It is easy to be seen that a plumbing code properly enforced protects the honest sanitary plumber in his native disposition to do right. It compels the lowest bidder to part with his mental reservation as to scamp work and cheap material and to adopt his competitor's standard of sanitary plumbing. The plumbing code, too, protects the owner or householder from his own misguided efforts in a technical field of operations. The landlord under official regulations is urged to provide plumbing as safe and sanitary for tenants as that provided for himself. The principles of code-regulated plumbing are the same in the tenement district as on Broad street.

Still another benefit to accrue from plumbing regulations, is that the installation of imperfect and inadequate house drainage being prohibited, especially in tenements and houses built to let, the nuisances from such sources, sure to follow, are likewise prevented. The position of fixtures in relation to each other and the arrangement of these with respect to the soil pipe and vent pipes are regulated to accord with the best sanitary and economic effect.

The plumber is not always to be blamed for unsatisfactory results. The owner insists upon low estimates for work and selects the plumber with cheap material and scamp workmanship. The owner may not know that cheap plumbing is the most expensive in final results Here again, official regulation shows its merits by enforcing upon plumber and owner alike the construction of sanitary plumbing with correct material and workmanship. It is the old story of sanitary authority, protecting the public against its own evil doings.

A system of sanitary plumbing calls for good material and good workmanship, tight joints, complete ventilation and ample water supply. It is the business of the architect to place fixtures with a view to convenience and proper service. The house should be built as a composite whole with plumbing as an essential part, whose location should receive the same attention as other building features.

There are in this city 100 master plumbers and 125 master drain-layers. In 1909 there were issued 2,370 sewer permits and 2,053 plumbing permits at the office of the plumbing inspector. During the same year 5,796 official inspections were made by two inspectors. These inspections were confined to plumbing work, that is to say, work inside of buildings, while the drainage work outside of buildings was not inspected or regulated because of a lack of sufficient number of inspectors. Despite this neglect of official regulation of house drainage, figures show a decided improvement over former administrations.

Records of inspections show: 155 for eight months in 1907; 940 for 1908; 5,796 for 1909. These figures exemplify the character of plumbing regulations in Columbus for many years past. Figures would indicate that the plumbing rules are better enforced today than ever before, yet there is no control whatever exercised over 125 drain-layers and their work, aside from the useless permits issued.

A year ago, for the first time in the history of the city, the council passed an ordinance establishing an examining and licensing board for plumbers and drain-layers. This injunction procedure was instituted by a group of plumbers. As a result of the law's delay any person can do plumbing work without qualification. The town is "wide open" to scabs and empty pretenders. The plumbing lid is off, attracting the refuse plumbing quacks of other cities.

Who is responsible for this neglect of sanitary regulation? The public seems not to know or care. The plumbers and drain-layers are not losing sleep in worry over the situation. The civic organizations of the city, looking after the public weal in other affairs, are not disturbing the plumbing air with resolutions or other activities for release from this public disgrace. In technical matters touching public health interests requiring official regulation, the people naturally and necessarily depend upon proper authority to safeguard their best interests. It may be pointed out here that the first thing to be done is to establish a plumbing board to qualify plumbers and drain-layers. A reasonable license fee and permit fee should be fixed. No permit to do work should be issued except upon acceptable plans submitted to the plumbing inspector. To do all the work of inspection and to keep proper records, and to issue permits based upon examinations of plans for proposed jobs, three more inspectors should be appointed. The new territory annexed to the city will impose an increased amount of plumbing regulation to be accomplished.

The duty of Columbus plumbers as representatives of one branch of the profession of mechanical arts, should not be neglected in this crisis of plumbing interests. Perhaps no art's craft is so nearly allied to public hygiene as that of house drainage. This relation to the public welfare, in a technical service, places the plumber in a class with professional men. The scientific knowledge necessary to the qualification of a master plumber presents the professional attitude which he should maintain toward the public. From this viewpoint the profession of house drainage is in the same class with other professions.

The primary object of any honorable profession is to bless mankind. The proceedings of the National Association of Master Plumbers, as reflected in the report of its sanitary committee, characterizes the sanitary plumber. He belongs to a profession whose organization necessarily depends upon safeguarding the public interest. No profession can or should exist whose motives and activities ignore the public good. The progress and professional integrity of plumbers as an organized body and as individuals rest upon a fair and honorable attitude toward the people. This fact should be the slogan of the plumber.

The inference is plain in the present crisis. The plumbers should lead the people and the city authorities to a more satisfactory administration of sanitary plumbing. If they do not seek reform methods in the installation of house-drainage systems, as a matter of professional interest, then these authorities should look to the sanitary interests of the people by providing for a rigid enforcement of the plumbing code.

A few years ago when plumbing regulation was placed under the board of health, an up-to-date code was placed in effect under inspectors instructed to enforce its provisions. What happened as a result? The selfish interests of mechanical artisans made all manner of opposition and preferred charges against the inspector. Municipal authority was induced to so cripple the plumbing code and its administration that the efforts at a much-needed reform failed. Since that time, as before, the enforcement of the plumbing code is a disgraceful farce.

The citizens are just waking up to the horrible housing conditions of the city. One of the constant and characteristic features of tenement houses is the flagrant and filthy violation of the plumbing code. Plumbing administration at present is lodged in a sub-department of the building inspector. A second attempt to pass an ordinance to establish an examining and licensing board for plumbers has resulted in obstructive methods the same as when reform measures were attempted by the board of health.

The question before the city administration and the public is (1) whether there shall be created an examining and licensing board for plumbers to determine the qualifications of men to conform to plumbing rules: (2) whether competent inspectors shall be required to enforce plumbing rules and to protect the people from the abuse of weak and unruly plumbers; (3) whether a growing city is to be redeemed from generations of plumbing misrule; (4) whether the health interests of the public are to be protected by a full and competent enforcement of the plumbing code.

HOME-MADE WATER-WORKS.

By Monroe Woolley.

A citizen of some mechanical ingenuity in a small town, finally tiring of the procrastination of the council in putting in a municipal water-system, has, by the aid of two old boilers and some galvanized pipe, fitted his

Fig. 1. Home-Made Water-Works.

residence with a system suitable for all household-uses and for fire-protection. Procuring two old boilers at a low price, each having a capacity of 250 gallons, he mounted the pair side by side on a trestle next to his wood-shed, as shown in Fig. 1, connecting the two together. The corner of the main part of his residence, marked x, being six inches higher than the top of the boilers, rain-water is drained by gravity from the roof thereof through galvanized pipes to the storage tanks, which have a total capacity of 500 gal., thereby giving

good pressure. From these tanks the water is forced to the kitchen and bath in the house. For fire-protection, a force-pump has been rigged up in the room marked x, Fig. 2, which shows the water-main leading diagonally

Fig. 2. X Shows Location of Force-Pump.

across the surface of the building to the main supply-pipe. In the corner of the same picture, between the two windows, is shown a covered hose-reel, equipped

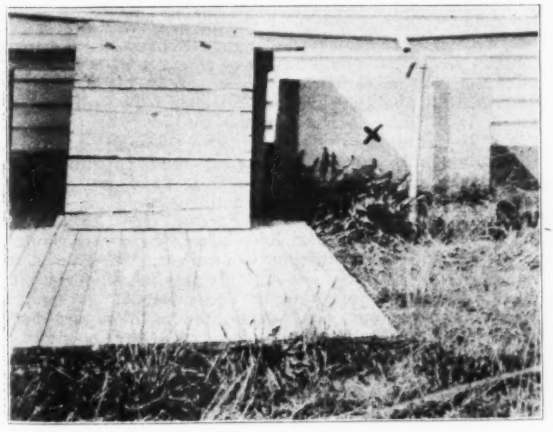


Fig. 3. X Shows Location of Cistern.

with 100 ft., more or less, of 1-in. hose, which is rapidly unwound and attached in case of fire. The pressure from the tanks has also permitted this owner in a town getting its water solely from cisterns to have green lawns and a fine garden through the summer. Water for the cistern, shown in Fig. 3, is drained chiefly from the kitchen-roof, shown in Fig. 2. This water does not pass through the tanks at all. Fig. 3 also shows a concrete filter with the supply-pipe leading into it. The filter-box is about 3 ft. square, 3 ft. high, and the sides about 6 in. in thickness. It is filled with rock and gravel, through which the water must pass on its way into the cement-lined cistern. As all the materials used in this system were second-hand, the entire cost, exclusive of labor, was less than $30.00.

NEWS FROM PITTSBURGH AND VICINITY.

There has been considerable activity in the plumbing and heating trade in the Pittsburgh territory during the past fortnight, and a number of good contracts have been secured in both lines. The Jenkins arcade and office building is the largest job now under way, and it is listed to be ready for "opening" not later than April 1, 1911.

The largest plumbing houses who have been making a specialty of high-grade chandelier work report business as a little off color just now, buying being very light.

The best contract a plumbing firm has secured during the past few days on a lighting proposal is that by Weldon & Kelly, who have the business of chandeliers and lighting effects for the Presbyterian church of Millvale, Pa.

One new plumbing firm was organized here during the past fortnight, and it will be located in Carrick, a suburb. The sign over the door will read McCullough & Trenhauser.

Among the more recent contracts secured by local plumbers are the following, of which the Knoxville Plumbing Co. leads the list with five new contracts:

Knoxville Plumbing Co.—The Martin Heck bungalow, Brookline, being built at a cost of $3,500.

Two bungalows in Brookline for Thomas Agnew.

George A. Bonheyo residence in Carrick, costing $3,400.

Plumbing and heating for two dwellings for H. B. Macrory, total cost $6,000.

Howard Heinz, son of the man of pickle fame, is erecting a $75,000 residence on the North Side, and the plumbing contract has been secured by W. N. Sauer.

Plumbing work in the new parsonage of St. Johns Evangelical church, McKeesport, Pa., is to be done by Childs Bros., McKeesport, Pa. The parsonage is costing $5,500.

The same firm has secured the plumbing and heating work for the new $6,500 residence for Dr. Elizabeth C. Mallison, McKeesport.

At Coraopolis, Pa., a new building is being erected by the Y. M. C. A. and the plumbing has been secured by Ira Mann, Pittsburgh.

The Kress Plumbing Co. has obtained the contract for the plumbing in the $8,500 store and apartment block being built by Joseph Irlbacher.

Heller & Perrin, wholesale grocers of Chatham street, are erecting a $30,000 warehouse, and the Enterprise Plumbing Co. has obtained the plumbing contract.

Stahl Brandt, Connellsville, Pa., has secured the plumbing and heating for the new $13,000 school-building in South Connellsville, Pa., which is being erected by the Connellsville Township School Board.

Among the dwelling contracts booked by local plumbers of late are the following:

T. A. Blockham, the $3,000 residence of Joseph Gratton; E. S. Aurandt, $2,500 residence of E. A. Geary; the Beechview Plumbing Co., $5,200 residence of Mrs. Frank Clements and the $5,200 residence for Charles Brown at Dormont, Pittsburgh; Fred Doerzbacher, plumbing in two bungalows in Brookline of George E. McKee; E. Robinson, contract for $5,000 residence of P. F. W. Bithell, Pittsburgh.

Among the heating contracts let in the district during the past week were the following:

The Johnstown Supply Co., Johnstown, Pa., received contract $10,000 parsonage, Johnstown, for St. Mary's Roman Catholic Congregation; W. K. Vankirk, Elizabeth, Pa., received contract $5,500 parsonage, McKeesport, Pa., St. Johns Evangelical Lutheran Congregation; Y. M. C. A. building at Coraopolis, heating secured by Baker, Smith & Co., Pittsburgh, Pa.

PACIFIC COAST LETTER

With the exception of municipal work there are but few large plumbing contracts being let at the present time, and the prospects are that the bulk of the work to be done in San Francisco for a time will be in small structures, for the downtown district is now well built up and but few large buildings are being planned. There is considerable work being done in the outlying districts, however, in the line of residence and flat-work, and about the same number of journeymen are finding employment as has been the case for the past two years. There is still much complaint on the score that contracts are being figured too closely, with the result that the small plumber is not able to compete successfully with the large shops, and a number of the former are going out of business. Several have closed up shop during the past six months and have removed to interior cities of the state, where the increased attention being paid to sanitation is bringing a great demand for plumbing work. Well-informed plumbers expect to see this process of elimination carried out still further, and while more journeymen may be employed in the immediate future they do not look for a material increase in the number of shops, for the facilities now at hand are such that the normal amount of plumbing work for a city of much greater size could be easily taken care of.

Work on public-school buildings is still a feature of the plumbing business here and will continue to be for some time, for there are many new buildings being planned, and as soon as the ones destroyed by the fire of 1906 are replaced the old ones not burned will be torn down to make room for modern structures. The plumbing work in the Newton J. Tharp Commercial School on Grove street has just been completed and this fine structure is now ready for occupancy. The toilet-fixtures here were furnished by the Climax Sanitary Co., Detroit, Mich. Most of the work on the McCoppin Primary School on Seventh avenue has been finished, the installation of the plumbing fixtures having been delayed through the late arrival of goods from the factory. At the Burnett School on Lane street the rough plumbing work is being installed and is about 60 per cent completed. In the Clement Primary on Noe street the toilets are being installed. In the Holly Park, on Holly Park avenue, work has been rushed and the plumbing and other work is ready for the installation of toilets. At the Longfellow Primary the plumbing work is almost completed and the structure will soon be occupied. At the Sheridan Primary the sewer-connections have been made and the plumbing work has been completed, with the exception of the installation of the urinal troughs. The city architects are working on the plans for a number of new schools, among which are the Sutro School, the Polytechnic High School, the Girls' High School, Visitation Valley School and Grattan School.

David Gibbs has been awarded the contract for installing the plumbing system in the 5-story building being erected by Harry and West Chamberlain at Sacramento and Cushman streets, the consideration mentioned being $2,800.

Work is being rushed on the building to be erected by the regents of the University of California on First street, just off Market, and it will be but a short time before Willam S. Snook & Son can commence the installation of the rough plumbing. The contract of the Pacific Fire Extinguisher Co. covers the heating, ventilating, installation of a sprinkler-system, compressed-air system and electric wiring. The total contract is valued at $10,400.

Additional plumbing work has been planned for the San Francisco Hospital and this will be done by V. J. Belknap for $3,191.

During the month of September repair work to plumbing systems in the public schools of this city cost $422.40.

The John G. Sutton Co. has applied for a permit to store fuel-oil at Clay and Jones streets; at Pine and Mason streets, and at the Peabody Primary School on Sixth avenue, where work is being done by it.

J. D. Hooker, a dealer in plumbing supplies at Los Angeles, is in San Francisco this week.

J. A. Talbot, a manufacturer of steel pipe, is also up from Los Angeles to inspect the new plant being erected at Richmond.

H. H. Walsh, a plumber from Stockton, Cal., was visiting local wholesalers last week. He reports much building in Stockton, but there is a feeling of unrest there in labor-circles.

C. M. Heath, a plumber of Santa Cruz, was here last week purchasing stock.

Some very large shipments of heavy pipe have been sent to Taft, Cal., recently, where a distributing system is being installed to utilize natural gas.

San Francisco journeymen continue to send funds to Los Angeles to assist the strikers there and the situation is said to be favorable for the men out. Only five out of a total of 2,000 have left the union-ranks. The national body has an organizer there and will continue to keep him in that field.

The contract for the installation of the heating system in the new courthouse at Everett, Wash., has been let to Adams & Co., Seattle, on their bid of $6,490.

RECEPTION IN HONOR OF PRESIDENT A. SELDEN WALKER.

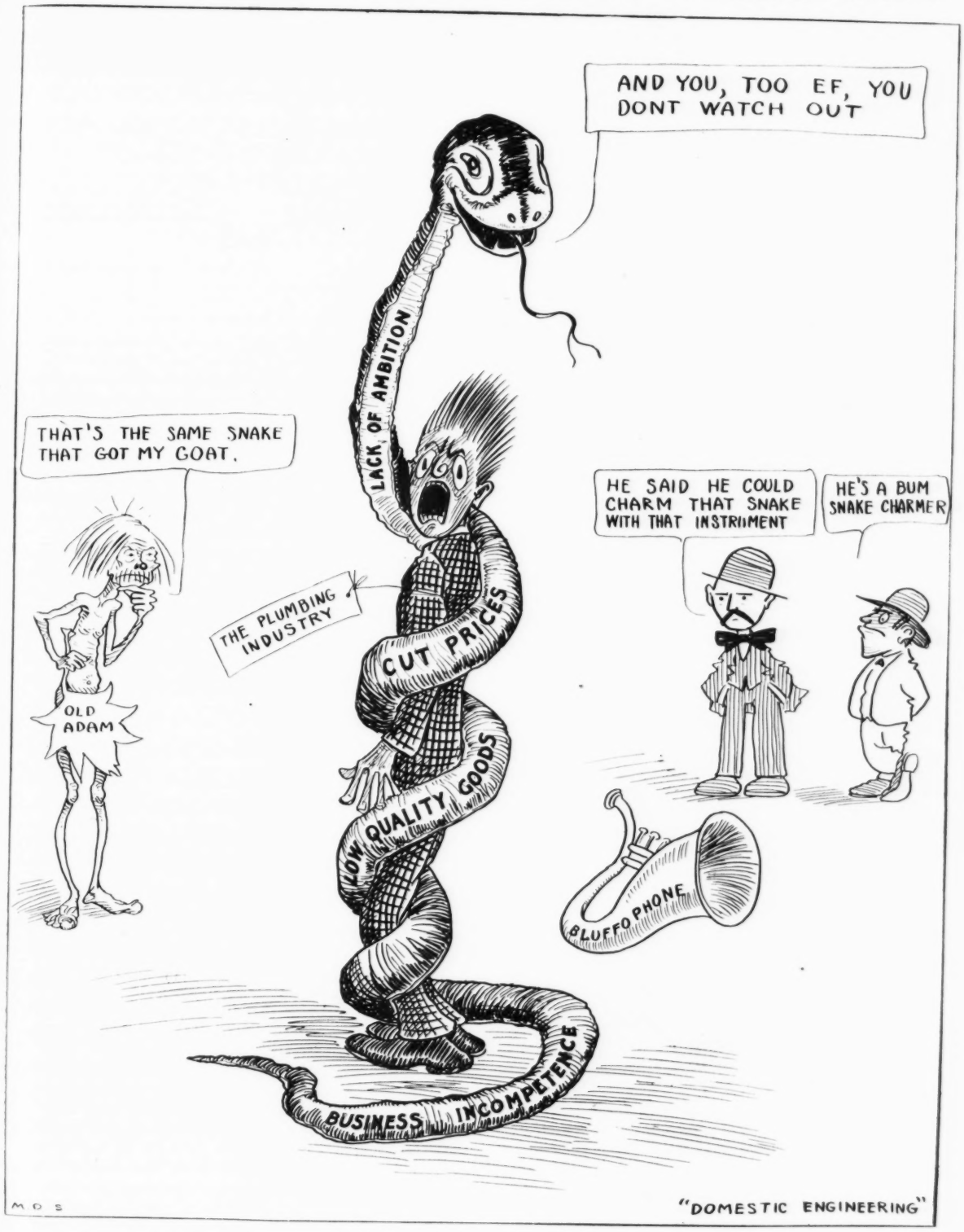
The Master Plumbers' Association of Newark, N. J. has issued invitations to a reception in honor of its fellow member, A. Selden Walker, president of the National Association of Master Plumbers. The reception will be held at Achtel-Stetters, 844 Broad street, Newark, on Thursday evening, November 17th. Tickets to the banquet are $3.50 each. F. J. Sturn, 43 Hill street, Newark, is chairman of the arrangement committee.

NEW BOOKS.

"The Age of Mammals" is the title of a new and interesting work by Henry Fairfield Osborn, and recently issued by The Macmillan Co., New York City. A volume of over 600 pages, copiously illustrated, it deals with the wonder-inspiring subject of the age of those ancient ancestors of the mammals of the present day and traces their evolutionary processes. King Richard had he lived 4,000,000 years ago would have had to call for an Eohippus and as it was a retiring brute of great speed, his call would have probably remained unheeded. To those of our readers who have private hobby-studies, and these including the study of the beginning of things, the "Age of Mammals" will prove a source of much profitable investigation. The price of the work is $4.50, postage prepaid, obtainable direct from the publishers.

"Workingmen's Insurance in Europe," by Lee Frankel and Miles M. Dawson, has been placed before the public by the Charities Publication Committee, 105 East 22nd street, New York City. As its title implies, it deals with the vital topic of workingmen's insurance, presenting European conditions. In Europe the problem has been grappled with in a very effective way, the results being astonishing in many cases and eliminating the many evils that daily confront the American employer, employee and unemployed. Manufacturers and employers of labor of every class in this country will soon have to give their attention to the insurance question, more especially in regard to the limited-liability insurance. Because of this, we would invite our thinking readers to add this excellent and most authoritative work to their collection. It deals with a vital subject and a study of its contents will enable us to grapple with the issues that will inevitably arise with a good basic understanding of the essentials involved. The price of the work is $2.50, postage extra. It can be obtained from the publishers direct, or from the Book Department of "Domestic Engineering."

"Domestic Engineering" Cartoon on "The Business Menaces," No. XI.


AND YOU, TOO EF, YOU DONT WATCH OUT
LACK OF AMBITION
THAT'S THE SAME SNAKE THAT GOT MY GOAT.
OLD ADAM
THE PLUMBING INDUSTRY
CUT PRICES
LOW QUALITY GOODS
BUSINESS INCOMPETENCE
HE SAID HE COULD CHARM THAT SNAKE WITH THAT INSTRUMENT
HE'S A BUM SNAKE CHARMER
BLUFFO PHONE
M O S
"DOMESTIC ENGINEERING"

The Coils that Stop Business-Circulation.

We are receiving requests from readers for reprints of these cartoons for framing. We will forward extra copies to subscribers for "Domestic Engineering" upon request.

HOUSE-HEATING BOILERS NEED CARE.

In one house, where your correspondent visited, a boiler tube was found bulged out as at A in Fig. 1. When heating contractors have installed steam-heating systems it is safe to assume that the working parts of the plant are adjusted right and that the parts are in good working order. But in my experience I have observed that after the plant has been in operation for a time, there are liable to be troubles of various kinds due to non-effective service on the part of the persons who are in charge of the apparatus.

The modern heating apparatus is about as perfect as one could wish. The average up-to-date heating devices

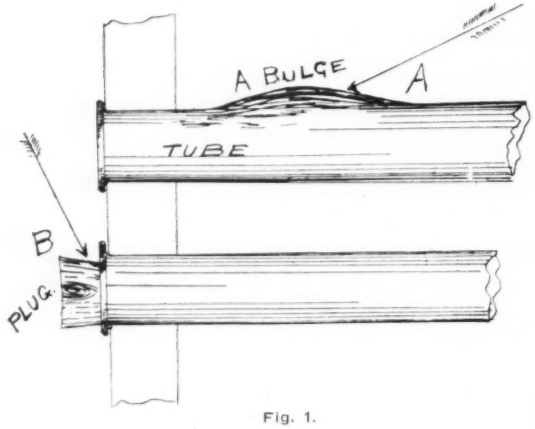


Fig. 1.

are made to do good work, and so they will, if they are properly cared for.

In the case in question, scale was allowed to accumulate in the tube. This resulted from the poor water used. The gathering of the scale prevented the water from reaching and cooling the metal. Hence, after a number of times of heavy and uneven firing, the tube metal commenced to bulge as shown.

In another case in which the tube was put out of working order, due to similar causes, the man of the house proceeded to plug the tube by driving a wooden peg into the end as at B, also shown in Fig. 1. In order to get

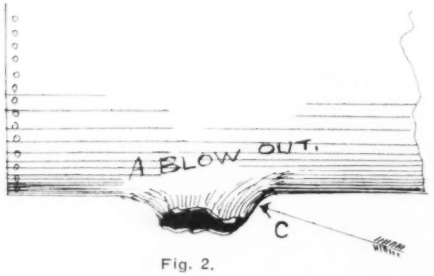


Fig. 2.

this job fixed right, it was necessary to cut out the tube and substitute a new one.

In another home where the heating plant was out of commission a blow-out was found in the boiler as shown at C in Fig. 2. This blow-out was caused by the gathering of boiler sediment for a long time.

The average steam-heating plant will stand a great deal of abuse before it succumbs.

I have seen heating plants running in houses and hotels under such conditions that I have wondered why the boiler did not explode. I have seen parts which ought to be clear completely choked with soot or ashes. Sometimes a broken part is fixed by the home-mechanic in such way that it is a danger element. Occasionally we have an accident, but accidents are remarkably far apart, when it is considered how many hundreds of steam and

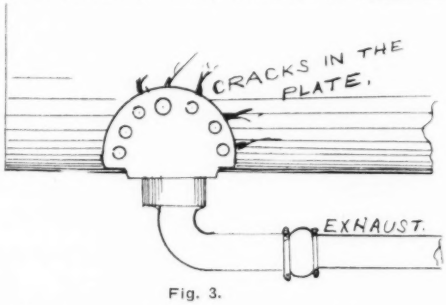


Fig. 3.

hot-air heating devices there are in successful operation in the winter time in every community. In the case of the example shown in Fig. 2, the scale and general sediment piled up in the bottom of the boiler next the fire box, therefore the fire heated the plate to the expanding point. The collection of hard stuff on the inside of the boiler prevented the water from reaching the plate and maintaining the proper temperature. Consequently the plate blew out one day, the water put the fire out, and the house was filled with steam frightening the occupants.

A similar occurrence happened in connection with the exhaust pipe union on a boiler as shown in Fig. 3. In this case a series of cracks resulted due to the intense heat on a point not effectually protected by the cooling waters within the boiler. The plate held together, but threatened to break and release the steam at any moment, hence an entirely new plate had to be put in, as was done for the blow-out plate in the former illustration.

It takes generally several days to install a new plate in

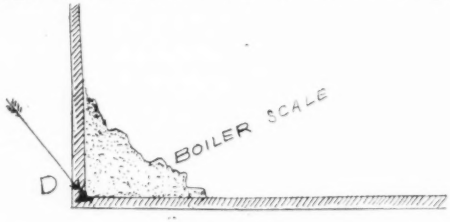


Fig. 4.

a boiler, and the expense is larger than the average householder likes to bear.

At D in Fig. 4 is shown how a boiler corroded and got weakened in the lower corner, as represented by the dark portion at D, beneath the collection of boiler scale. In time this place got eaten out by the corrosive action of the chemicals involved.

It is therefore a good plan to have your boilers examined and washed out before using each season. More or less scale is quite sure to collect and make trouble.

In one home where everything about the heating plant was in good order, the defect prevailed in the manhole cover-opening in the boiler as shown at E in Fig. 5. The edge of the shoulder of the plate forming the hole was partly eaten off by the action of the chemical matters used with the water for some years. Consequently there was a leak here. A rubber gasket was put in but this did not prevent the leakage of steam. Before this job was finished, a section of the plate had to be turned out and a

new hole flushed on that entire side for the reception of the manhole cover.

I recently saw a very bad job about the water-pipe in a certain boiler. The plate about the inlet had become weakened and was leaking. The workmen who had the

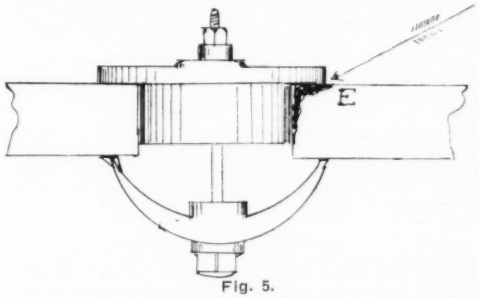


Fig. 5.

job in hand cut out a rough patch of plate metal and this patch was unevenly riveted on as shown at F in Fig. 6. The patch stopped the leaking places for the time being, but the job was rough and poorly executed. Men engaged in repair work on boilers in steam-heating plants in residences and public buildings ought to have enough pride

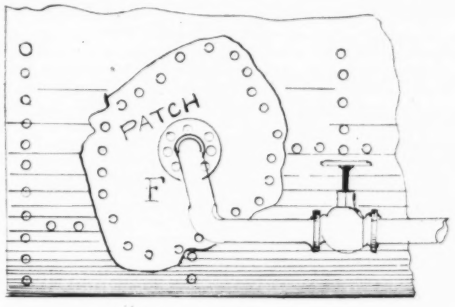


Fig. 6.

to do good work. As a rule the men do, but now and then I come across a botch job like that shown herewith in Fig. 6.

LEGAL DECISIONS.

Points of Special Interest from Suit to Recover for Changing Heating Plant.

In a suit to recover a balance claimed to be due for changing a heating plant it appeared that the defendant was the owner of a house in which there was a heating apparatus which was a combination system of steam and hot-air, which the plaintiff was called upon to examine with reference to making some alterations therein. He advised the taking out of two old boilers in the cellar, putting in new boilers and new piping in the cellar, the removal of the hot-air pipes and registers which formed a part of the old system, and the installation of radiators so that the heating should depend entirely upon the steam-supply. This suggestion was adopted. During the progress of the work certain additional defects in the old system were brought to light, particularly in some of the old radiators, which had burst, and in some of the valves, which were defective. With the consent of the defendant the plaintiff remedied these defects.

The plaintiff claimed that the fair and reasonable value of the work that he did was $1,729.99. The defendant contended that the plaintiff agreed to do the work for $1,500. It seems that, when the plaintiff was looking over the old plant, the defendant asked him what the changes would cost, and that he replied that it would cost in the neighborhood of $1,500. The defendant testified that he said it would cost not to exceed $1,500. But the second appellate division of the supreme court of New York does not think that this could be construed as a positive agreement to do the work for that sum, or for a sum not to exceed that. It must be considered only as an approximate estimate, and, the court says, Weibert vs. Hanan, 121 New York Supplement, 35, experience shows that, when alterations are attempted in an old house, frequently the expense is greater than was anticipated. In addition to that, concededly some additional work was done which was not contemplated at the time of the inception of the work.

Another contention of the defendant was that the plaintiff's agreement was that the work which he was to do should produce a specified result, namely, that it should heat the house, and the plaintiff testified that he understood the thing that was particularly wanted was to get the apparatus in such shape that the house could be heated. If his work had been to put in an entire new heating plant in the house, and he had done so under such circumstances, and it had failed to heat the house, there would have been much force in this contention. But this was not his contract. He was to use so far as possible the old plant. He suggested certain specific alterations, as above noted. Doubtless he thought that would accomplish the result. If the failure were due to defects in or inefficiency of the parts supplied by the plaintiff, the defendant should not be made to pay. But if they were due to other defects still existing in the old system, which the plaintiff had not undertaken specifically to remedy, it would be a harsh rule to deny him compensation for what he had done because the system still worked badly. This was particularly so, since it appeared from the evidence that after the plaintiff's work was completed, and the defendant complained that the house was not properly heated, the plaintiff wished to make some further alterations in the old work by the introduction of new and larger risers to conduct the steam to the heating surface, and the defendant refused to permit him to do so.

In conclusion, the court says that the decision in this case, in the plaintiff's favor, seemed so eminently just, that the court should not be astute to seek for grounds upon which to reverse the judgment, and it affirms it.

ODD SAYINGS.

A newspaper, describing the doings of a convention, said: "The procession was very fine and nearly two miles long, as was also the prayer of Doctor Perry, the chaplain."

Over a bridge at Athens, Georgia, is the following announcement: "Any person driving over this bridge at a pace faster than a walk, shall if a white man, be fined $5, and if a negro receive twenty-five lashes, half the penalty to be bestowed on the informer."

A steamboat captain, advertising an excursion, says: "Tickets, 25 cents; children half price to be had at the office."

On a certain railway the following luminous direction was printed: "Hereafter, when trains in an opposite direction are approaching each other, on separate lines, conductors and engineers will be requested to bring their respective trains to a dead halt, and be careful not to proceed till each train has passed the other."

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NOTICE TO ADVERTISERS.

Copy and cuts for advertisements intended for a particular issue should reach the office of Domestic Engineering on Monday of the previous week if it is desired that a proof of the advertisement shall be submitted. New advertisements can be received up to noon of Monday of the week of issue, but no proof can be shown.

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Member of the Federation of the Trade Press Associations of the United States.

SPECIAL NOTICE TO READERS.

Our readers are invited to send in articles on any topics covering sanitary interests as outlined above. Photographs and drawings with descriptions of special interest to plumbers and steam-fitters are welcomed. "Domestic Engineering" pays at space rates for all articles, notes, criticisms and news data so contributed.

Among the Wholesalers

WILL MANUFACTURE HEATING GOODS.

The Interstate Heater Co., Cleveland, O., has been incorporated with an authorized capital of $100,000 to manufacture and sell heating and ventilating materials and systems by Gottlieb Mueller and others.

PLUMBING SUPPLY HOUSE MOVES.

The Newark Supply Co., Newark, N. J., has moved its plumbing and heating supply store from 18-20 Mechanic street in that city, where it has been located since the company began business about six years ago, to its warehouse at 31-39 S. Second street, Irvington, N. J., a suburb of Newark.

MAYOR LANE & CO. IN NEW QUARTERS.

Mayor Lane & Co., New York, have moved their plumbing and heating supply business from 128-132 White street, where it has been located for many years, it being one of the oldest plumbing supply houses in the city, to new quarters at the corner of Hudson and Charlton streets, where it occupies the ground floor of the modern new building recently erected at that address.

WELL-KNOWN CANADIAN MASTER PLUMBER THE WINNER.

The Ideal Carriage Washer & Automatic Water Saver Co., 561 East Main St., Rochester, N. Y., announces that the contest for a suitable name for its new automatic water-closet combination has been closed, and that the name, "Auto-Silent," submitted by Frank Powers, a well-known master plumber of Lunenburg, Nova Scotia, has been adopted. Mr. Powers will receive a complete "Auto-Silent" closet with the invisible tank outfit, which is listed at $39.

IRON CITY SANITARY MFG. CO., CELEBRATES ITS TENTH ANNIVERSARY.

The Iron City Sanitary Mfg. Co., Pittsburgh, Pa., was founded in Zelienople, Pa., on November 5, 1900, and the tenth anniversary of this event was celebrated Saturday evening, November 5, with a dinner at the Fort Pitt Hotel in Pittsburgh. Officers of the company, departmental heads and the office force were present. Several addresses were made both by officers and employes. After the dinner all were entertained at a theater party in the Grand Opera House. The officers of the company are: A. A. Frauenheim, president; Charles A. Fagan, vice-president; John A. Kelly, secretary and treasurer. The company employs over 1,000 men in its different departments.

THE MUELLER COON CLUB'S ANNUAL COON-HUNT.

The Coon Club of the H. Mueller Mfg. Co., Decatur, Ill., gave its annual coon-hunt Saturday evening, November 5th. At 5:30 a party of 60 comfortably ensconced in 10 big touring cars left the factory for the hunting grounds, which are located in the Sangamon river bottoms eight miles west of Decatur. The air was crisp and pleasantly biting, but friendly campfires built at intervals along the trail of the hunt served to rob the event of any real discomfort.

"Bill" Hite, a famous central Illinois coon-hunter of pioneer days, was on hand with two trained coon dogs, and the real hunt began about 7:30 o'clock and continued until 11 p. m.

Twenty minutes after the start the dogs captured a large possum and later ran another down, but the party was unsuccessful in bagging a coon. The dogs treed two, neither of which could be dislodged from their lofty perches. One had sought refuge in the stump of a tall sycamore. A fire at the base dislodged the coon, but he sprang to a live part of the tree and mounted to the highest branch about fifty feet in the air, and from this perch

viewed the crowd below with great unconcern. After an hour's effort he was abandoned against the protest of the coon-hunter, who insisted that it was bad ethics to give up a coon after he had been treed. But "Bill" was outvoted by the hungry crowd and reluctantly called off his dogs, which had patiently sat for an hour at the base of the tree refusing to budge.

The crowd felt that the dogs had done their duty, and remembered with pleasure their deep baying as they crashed through the underbrush on the trail of the coon, and the sudden change to a sharp, anxious yelp that told of the treeing of the coon.

The club had for its guests Adolph Mueller, president, and Robert Mueller, secretary, of the H. Mueller Mfg. Co.; Granville Meyers, patent attorney, Washington, D. C.; F. M. Bailey of the Metal Worker, and Thomas J. Scroggins, on whose hundreds of broad acres the hunt was held. Mr. Scroggins, though 75 years of age, followed the dogs as actively as any younger member of the party.

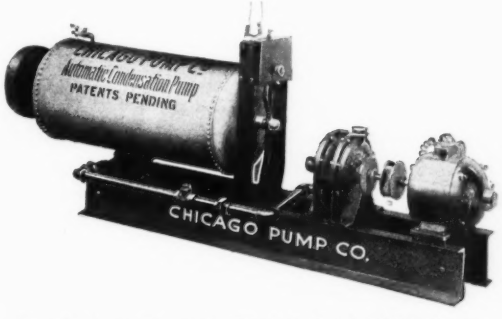
Between 11:30 and 12 o'clock following the hunt a hot supper was served in a pavilion. And then came a stag dance to the music of the Mueller Mandolin Club, a skirt dance by Carl Heiby, a stag quadrille and songs by the Mueller quartette, and the return home at 1 a. m.

AN AUTOMATIC ELECTRIC CONDENSATION-PUMP.

The automatic electric condensation-pump, manufactured by the Chicago Pump Co., 1055 Fulton St., Chicago, is used in buildings where the heating return pipes are below the boiler-level; where the high-pressure system is used for power and the exhaust for heating; where there is a difficulty in maintaining the proper temperature during the winter; for buildings where the steam-heating apparatus is defective; where they are too small to afford the necessary degree of heat; where through settling of foundations, water-pockets are formed in the piping; where through inefficient janitor-service the building is insufficiently heated. In these cases, the company claims that its product gives an instant and permanent relief.

The automatic electric condensation-pump consists of a multi-stage turbine-pump, direct-connected by flexible coupling to an electric motor, automatic electric controlling switch and automatic-tilt receiving-tank. The pump, motor, switch and tank are all mounted on one heavy iron sub-base and are all connected up, adjusted, tested and ready for operation before they leave the shop.

When a given quantity of water enters the tilt-receiving-tank, it acts upon the automatic regulator and starts



The Chicago Automatic Electric Condensation-Pump.

the pump and motor, which causes the water to be pumped from this tank into the boiler. The pumping of the water from this tank creates a vacuum in it, which in turn draws the condensation through the radiators and return-pipes. This causes hotter steam to be drawn through the heating system, thus enabling the radiators to heat up more quickly and also getting hotter return-water for the boiler. Buildings are said to heat more rapidly in the morning by this means, maintaining a comfortable amount of heat at all times with a very small steam-pressure. It prevents water-hammering and pounding in the steam-pipes and a saving of half of the firing and from 20 to 50 per cent of coal is claimed. This entire installation can be placed near boiler, takes up little space and requires no attention save oiling of motor about once a week. The cost of operation is very small. On new buildings this system obviates the necessity of digging a pit to place the boiler at a level where the heating returns will flow by gravity into boiler, thus doing away with the flooded boiler-pits, etc.

THE F. & K. BYPASS-WASTE.

In the manufacture of all plumbing specialties, several essentials must be borne in mind by the producer. The article under consideration must be capable of doing the duty assigned to it, it must possess durability and must be capable of as wide an application as possible. These essentials have been observed by the Findeisen & Kropf Manufacturing Co., Chicago, in the design and construc-

The F. & K. Bypass-Waste.

tion of its new bypass-waste, an illustration of which is herewith presented.

In construction it is of heavy cast brass and of heavy 1½-in. tubing, all highly finished. The tubing is 18 gage.

The valve has a ground-seat, which is opened and closed with a china lift, kept in place by a friction-spring and screw in the elbow at the top. It is designed with slip-joints and will fit all tubs of regular size regardless of height of tub and width of rim. The operating knob is located outside, similarly as in all standing wastes.

The principal function of this bypass-waste is to afford a means of removing the dirty water from the tub immediately without the possibility of it backing up through the overflow tube. It accomplishes this desirable result in a very simple fashion. The dirty water cannot enter the overflow-tube except through the overflow-strainer, and in overflowing the water passes directly through the bypass to the trap, leaving all parts clean and free from all fouling matter.

The waste is commendable for public use, as all its parts are integral, there being no chain, plug or waste to be carried away.

The apparatus is simple to operate, the raising of the knob opening the valve and the depression of the knob closing it. When the valve is open, it allows a direct unobstructed passage of 1½ in. through the waste-tube to the trap, the pressure of the flowing water keeping the tube perfectly clean. Further information concerning this waste can be obtained upon application to the manufacturer.

THE METAL MARKET

MUCH IRON SOLD.

The conservative estimate is to the effect that the amount of foundry iron sold in the Eastern markets during October was larger than any other month this year. The largest purchases were made by the two leading manufacturers of radiators, one of which bought 30,000 tons in October. In this connection it may be mentioned that the leading manufacturer of radiators is now booking more orders than ever before in its history. The buying during October did not look so large until the totals were figured up, for, as has been previously explained, the inquiries were scattered, coming in almost daily as compared with a sudden rush at former buying movements. The outlook is considerably more encouraging, and in the Southern markets the inquiry has been much larger than for several months, while in Cincinnati there have been numerous sales of small lots for nearby and future delivery. Matthew Addy & Co. report the following interesting sale: "A large foundry that tried in vain to buy at present prices for delivery over the second quarter of next year finally found no furnace willing to make a contract at present prices. The iron was bought to be placed in storage in November and December and to be paid for promptly, but the furnace is to carry free of storage charges for nine months." This is perhaps the strongest indication received recently that manufacturers expect the market to be higher next year than this year. The picking up in the price of old iron is an extremely favorable sign for better prices. Quotations are as follows:

No. 2 Southern foundry, Birmingham	$11.50 to $12.00
No. 2 Northern foundry, New York	15.75 to 16.00
No. 2X Northern foundry, New York	15.25 to 15.50
No. 2 plain, Northern foundry, New York	15.25
No. 2 Northern foundry, Chicago	16.00 to 16.50

COPPER MARKET MORE ACTIVE.

Consumers in this country have been buying copper steadily for six weeks. European consumers have likewise purchased metal more freely than any other time since the first month of the year. Deliveries are large, production is being curtailed and the monthly figures, issued by the Copper Producers' Association, will undoubtedly show a further reduction in copper stocks. Europe's visible supplies are decreasing week by week, and it will not be long before the large surplus in Europe has been appreciably reduced. Prices are steady and must be considered low, for the normal price is nearer 14 cents than 13 cents, which has ruled through practically the second half of the year. The copper exports in the United States for the first ten months of this year show a reduction of only 10,000 tons compared with the same period last year. Prices are steady and practically unchanged at 12.75 to 13 cents for electrolytic, and 13 to 13.25 cents for Lake.

PIG TIN STEADIER.

The market has steadied down considerably. There has been less speculation and larger supplies have arrived from abroad, so that the premiums paid for prompt shipments are no longer in evidence. Deliveries into consumption during the month of October were 3,300 tons, and the total deliveries so far this year show an increase of 3,600 tons. The visible supply throughout the world, however, was only 500 tons less than a year ago, but in the meantime the price has advanced practically 6 cents, or nearly 20 per cent. Tin can now be had at about 37 cents per pound in 5-ton lots, New York.

LEAD.

The market is steady and unchanged. The leading interest is demanding 4.40 cents New York, and the St. Louis price is 4.27½ cents.

SPELTER ADVANCES SHARPLY.

After hovering around 5.60 cents New York for several weeks, the spelter market jumped in three days to nearly 6 cents. The only reason given for this sharp advance is the shortage in the supply, and it is evident that the removal of the smelters from the gas district will make for higher prices. This will be a condition which will grow worse rather than better, and unless some new cheap fuel is found, spelter prices will probably remain at a higher level than in the last few years. Spelter is now selling at 5.95 cents New York and 5.80 St. Louis. Sellers are not anxious to dispose of their product even at these figures, but it must be said that they are working in harmony at least.

OLD IRON.

The market cannot be said to be gaining in strength rapidly, but there seems to be a spurt of good business and then activity subsides. It must be admitted, however, that these periods of active business are more frequent than two or three months ago. Prices show only slight changes.

No. 1 yard wrought, long	$13.00 to $13.50
No. 1 yard wrought, short	12.00 to 12.50
Machinery cast	12.50 to 13.00
Wrought pipes and tubes	10.50 to 11.00
Wrought turnings	7.00 to 7.50
Cast borings	7.00 to 7.50
Light iron	5.50 to 6.00
Stove plate	10.00 to 10.50
Malleable cast	12.50 to 13.00

BUSINESS CHANGES.

The plumbing establishment of J. B. Goodwin, at Lisbon, O., has been sold to Frank Chamberlain, who will continue the business. Mr. Goodwin sold out in order to assume the position of instructor in the sheet-metal classes at the Carnegie Technical Schools, Pittsburg, Pa.

B. O. Paulsness, Grand Forks, N. D., has moved his plumbing establishment from Lander block to the Elert block on DeMers avenue in that city.

Hitchcock Bros. are erecting a new building for their plumbing business at the corner of Franklin and Monroe streets, Peoria, Ill. The building will be a two-story brick structure with shop and show rooms on the first floor and offices on the second. It is planned to make the show rooms up-to-date in every respect.

Hewitt & Fenny, Pittsburg, Pa., have opened a branch house in Chester, W. Va., and to start with the firm has secured an exclusive contract to do all the plumbing and gas and illuminating work in seventy homes in Chester, all of which are owned by Charles A. Smith. Darrell G. Hewitt has been made resident manager of the Chester department, and he has removed his family from Pittsburg to Chester. As this place is just across the Ohio river from East Liverpool, O., the domestic pottery center of the United States, the firm will draw a large amount of work from that place, in connection with its local contracts.

STEAM-BATH TABLES IN THE BUREAU OF CHEMISTRY AT WASHINGTON.

In the accompanying illustration, Fig. 1, is shown a front view of one of the many steam-bath tables which have been installed in the new Bureau of Chemistry for the Department of Agriculture in Washington, D. C. These baths are formed of tables with hoods both of Alberene stone 1½-in. thick, with all joints cemented with a combination of litharge, glycerine and graphite mix-

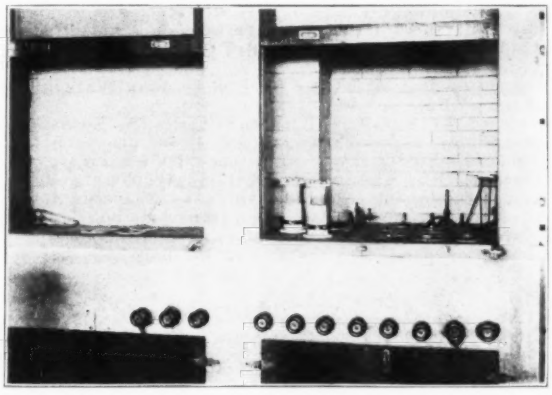


Fig. 1. Steam-Bath Table for Chemical Work.

ture. It is said that practical experience has shown that this stone is the only one capable of standing the chemical effects left by the acids which are used at these tables in the different vessels by which tests are made of foods, oils, etc., etc., now required under the Pure Food and other laws. The shelf or top of the bath table has cut in it a number of round holes of different sizes into which are set the vessels used in the testing experiments, and which extend down into the tank, in the bottom of which is a coil of pipe used for heating the water therein. Water

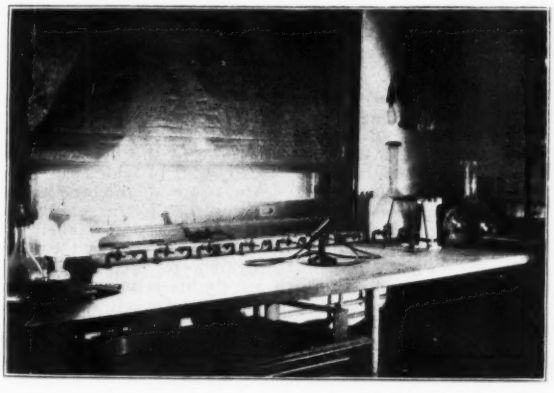


Fig. 2. Another Table for Experimental Work.

is introduced and when the height of the water is just a trifle above the coil of pipe, the flow is shut off automatically and partially by means of an arrangement placed on the line, and a fine spray of water allowed to flow into the tank to keep the water at the same height and replace that which is evaporated by the heat from the coil.

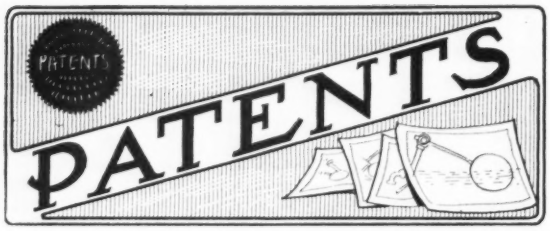
In the other illustration, Fig. 2, is shown one of the experimental tables in the Department of Agriculture buildings' chemical laboratory. This is one of many tables on which there are outlets for gas, water, vacuum and steam, to which are connected hose from the several testing vessels which may be in use on the table at the same time.

OBITUARY.

Robert Sproul, senior member of the plumbing firm of Sproul & McGurrin, of Grand Rapids, Mich., whose death occurred in his home in that city on Monday morning, October 31st, as told in last week's issue of "Domestic Engineering," was one of the most widely known master plumbers in Michigan. He was born 59 years ago in Glasgow, Scotland, where he learned the plumbing trade, and he came to this country in 1869, locating first in Detroit. In 1871 his employer in Detroit sent him to Grand Rapids to install a steam-heating plant in a local church. Mr. Sproul liked the city so well that he decided to remain and found employment with Thomas Smith, a pioneer plumber and steam-fitter in Grand Rapids. Wil-

The Late Robert Sproul.

liam T. McGurrin was at that time an apprentice in Mr. Smith's establishment. In the spring of 1876 Mr. Sproul and Mr. McGurrin formed a partnership and opened a plumbing establishment at the corner of Monroe and Commerce streets in Grand Rapids. The partnership formed nearly 35 years ago lasted till Mr. Sproul's death, and each of the partners had implicit confidence in the other. There were no partnership papers between them, but merely the old understanding that they should share and share alike. Mr. Sproul was married in 1873, and his wife, two sons and a daughter survive him. He was a member of the Knights Templar and of Dewitt Clinton consistory in Masonry, and of the Elks. He was an ex-president of the Master Plumbers' association of the state, and also of the local association. He was a member of the Curling club, and in the days of their activity was prominent in the affairs of the old Caledonia and Burns clubs. For several years he represented the Second ward in the common council of Grand Rapids. The funeral was held on Wednesday afternoon, November 2nd, under the auspices of the Knight Templars, and it was attended by the local lodge of Elks and nearly all the master plumbers and master steam-fitters of the city as well as by a large circle of friends.



973,551.—Valve. William L. Osborne, Chicago, Ill.

973,609.—Pressure-Regulating Valve for Gas-Burners. John A. Abraams, Wadsworth, Ohio.

973,663.—Blow-Off Valve. Henry W. Jacobs, Topeka, Kans.

973,697.—Apparatus for Screening Sewage and other Flowing Matter. Clyde Potts, Morristown, N. J.

973,773.—Water Heater and Purifier. William Asa Gibson, Peoria, Ill.

973,790.—Bubbling Drinking-Fountain. Simeon C. Keith, Jr., Somerville, Mass. A bubbling fountain, comprising a casing forming a chamber and having at its upper end an outlet port surrounded by a depending imperforate annular flange extending into the chamber, an inlet for delivering water into the outlet port, and a separate outlet through the casing located above the lower end of said flange, through which water is emitted only when the said outlet port is obstructed.

973,791.—Rotary Filter. Guy L. Kennedy, San Francisco, Cal., assignor to National Carbonated Liquid Co., San Francisco, Cal., a corporation of California.

973,794.—Pipe-Line System. Isaac Lightcap, Rocksburg, N. J. In a pipe line system, means for inserting and removing a pipe scraper comprising a by-pass including a scraper trap provided with means preventing the passage of a scraper therethrough, and means to divert the entire flow from the main line through the by-pass.

973,819.—Valve. Gustav Schmaal and Joseph B. Wicks, Paulsboro, N. J.

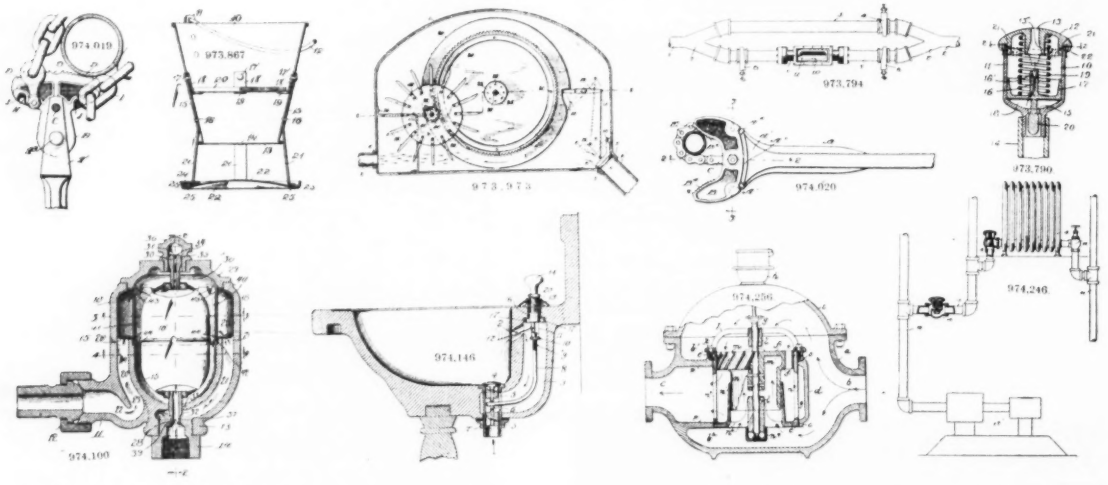
973,867.—Plumber's Pot. Charles A. Johnson, Jr., East Orange, N. J. A plumber's furnace comprising a body portion with flaring sides and an open top, a bottom plate on the body portion, right-angled clips on the inner sides of the body portion, legs lying against the body portion in line with the clips, rivets passing through the legs, the clips and the body portion to secure them together, the legs having projecting portions extending below the body portion and formed with bent ends, a bottom tray of concavo-convex form with the convex side upward having a peripheral flange extending upwardly along its edge, the bent ends of the legs adapted to lie on the tray and abut on the flange, and rivets passing through the tray and the bent portions of the legs to secure them together.

973,973.—Flushing Apparatus. Oscar Turner Richey, Tucson, Ariz. An apparatus of the character specified, comprising a casing having an inlet at one end, and an outlet at the other of greater capacity than the inlet, said outlet having a valve seat at its commencement, a valve normally resting upon and closing the outlet, an arm hinged to the casing at one end and connected at the other end to the valve, a shaft journaled transversely of the casing and extending outside of the same, the extended portion having a crank arm, a lever secured at its center to the shaft, a link connecting the one end of the lever to the valve, a disk journaled for rotation in the casing adjacent to lever and having a recess in its periphery engaged by the inner end of the lever when the valve is closed, a gear ring secured to one of the faces of the disk and concentric therewith, a shaft journaled adjacent to the disk on one side of the outlet, a pinion on the shaft meshing with the gear ring, a disk secured to the shaft, and a plurality of spaced wings extending radially from the disk and extending in front of the inlet on one side of the disk.

973,989.—Scale-Preventer for Boiler. John W. Stephens, Staunton, Va.

973,995.—Liquid-Fuel Burner. Charles A. Swartz and Sam Finley, Frederick, Okla.

974,019.—Pipe-Wrench. Lawrence R. Blackmore, McKeesport, Pa. The improvement in wrenches herein described comprising a handle having a head tapering toward its extremity and provided with a transverse bolt hole, and at its opposite sides with projecting studs extending in a direction parallel to the axis of the bolt hole, jaw sections recessed in their inner faces to fit said tapered head, and provided with openings to receive the lateral studs thereof, and with bolt holes registering, when the parts are applied, with the bolt hole of the head, the said jaw sections having jaw faces and provided in their inner edges with curved seats adapted to receive the rounded ends of open links, and having in said seats notches adapted to receive lateral studs, and a chain cooperating with the said jaws, substantially as set forth.



974,020.—Pipe-Wrench. Lawrence R. Blackmore, McKeesport, Pa. The wrench herein described comprising a handle provided with a wrench head having a concave seat, and a stem projecting beyond the same and provided on its opposite sides with lateral bosses, and with a transverse opening through the same, a chain having connecting links fitting over said bosses, duplex jaw sections fitting at their inner edges, the said concave seat of the wrench head, and provided with sockets receiving the ends of the lateral bosses of the stem, the said jaws fitting against the connecting links and retaining the same on the bosses, and a bolt passing through the same and the jaw sections and securing the same to the stem, each of said jaw sections being provided with opposite toothed faces and having on its inner face at its rear edge seats for engagement by the chain, and having its rear edge shouldered to engage with the wrench head at the opposite ends of the concave seat thereof, all substantially as and for the purpose set forth.

974,055.—Straightway Valve. John L. Halyburton, Hampton, N. J.

974,085.—Automatic Water-Controller for Boiler. Carl

E. Lindgren, Denver, Colo., assignor of three-fourths to Ruth B. Alberson, one-eighth to Frederick A. Douglass, and one-eighth to George M. Thorp, Denver, Colo.

974,100.—Steam, Air and Water-Trap Valve. John F. Boegen, Berwyn, Ill., assignor to Iroquois Engineering Company, Chicago, Ill., a corporation of Illinois. In a valve of the class described, the combination with a valve casing having a float chamber, closed at the bottom, and inlet and outlet passages communicating therewith, said discharge passage leading below the float chamber and terminating in a vertical discharge aperture, of a float guided in said float chamber and actuated by the rise and fall of water in the float chamber to rise and fall therewith, and a valve stem secured to the float and projecting down through a central opening in the bottom of the float chamber and closing the same, and sliding in and out of said discharge aperature to wholly close and open the same, said valve stem being provided with a lateral port at its lower end for affording a restricted discharge port when said valve stem is raised slightly from the closed position.

974,146.—Basin Waste and Overflow. Winfield E. Hinsdale, New York, N. Y. A controlling appliance for the valve of a lavatory basin, embracing a pull-stem, a surrounding sleeve therefor, and a friction device located between the two, said sleeve being provided with a lock-nut at one end and with one or more lugs at the other end; in combination with a curvilinear valve-operating rod secured to the pull-stem and an escutcheon adapted, when in position, to surround said pull-stem above the lock-nut and conceal the latter.

974,161.—Heating System. Herman Lemp, Lynn, Mass., assignor to General Electric Company, a corporation of New York.

974,201.—Steam-Trap. Sebastian Steinmitz, Scranton, Pa.

974,246.—Steam-Heating System. James A. Donnelly, Brooklyn, N. Y. In a steam heating system, the combination of a steam supply main, a return main, a plurality of heat distributing sections or systems each comprising one or more radiating devices, a branch supply and a branch return pipe affording independent communication for each section or system with said supply and return mains, a fitting, having a restricting orifice of fixed dimension, at the outlet of each radiating device, and a fitting, having a restricting orifice of fixed dimension, in each branch return, the area of said restricting orifices of the radiating devices of each section or system bearing a definite and pre-determined relation to the area of the restricting orifice of the corresponding branch return.

974,256.—Water-Meter. Ernest E. Gamon, Newark, N. J. In a water meter, the combination with a main casing having upper and lower receiving chambers and an intermediate outlet chamber, a propeller wheel mounted in said intermediate chamber, so arranged that the water in the lower chamber exerts an upward pressure against the propeller wheel, but has no communication with the outlet chamber, while the water in the upper chamber passes through the propeller wheel into the outlet chamber.

974,286.—Vacuum Cleaning Apparatus. Frank J. Matchette, Richard Raddatz, and Charles Moukos, Milwaukee, Wis.; said Raddatz and Moukos assignors to said Matchette.

974,504.—Pipe-Union. Charles J. Luther, Elizabeth, N. J., assignor of one-half to Joseph C. Davis, Maplewood, N. J.

974,517.—Pipe-Joint. Claude Revaillit, Nice, France.

974,563.—Automatic Pressure-Controller for Water and other Pipes. Ira G. Fosler, Chicago, Ill.

Plans are being considered by the city hall committee of the Menasha, Wis., city council for installing a new heating plant in the city hall. The present system has proven inadequate and it is expected to have a new one installed before winter arrives.

The Beloit Lighting & Heating Co., Beloit, Wis., has been incorporated with a capital stock of $30,000. The company will manufacture appliances for making gas from gasoline for lighting and heating purposes. H. W. Adams, Charles H. Jones and S. G. Strong are the incorporators. The patents under which the company will operate are owned by the inventor, C. E. Sayer. A plant will be erected at Beloit and C. H. Jones will be manager of the company.

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WANTED—YOUNG MAN WITH EXperience in preparing advertising copy for the plumbing and heating trade. Address, giving full particulars, No. 471, "Domestic Engineering," Chicago.

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